

DESIGNED FOR DISASSEMBLY

THE PUSH FOR A NEW APPROACH TO SPORTS ARCHITECTURE IN
THE 21ST CENTURY

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The Academic Faculty

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THE 21ST CENTURY

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To my family, for their endless support

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SUMMARY

The architecture of the sports stadium has evolved dramatically throughout its history. From the ancient gladiatorial arenas to the domes and retractable-roof ballparks of the 20th Century, the stadium has become an iconic and integral part of life, in our modern society. Through the globalization of sports and sporting events, such as the Olympics and World Cup, new and more exciting opportunities are being extended to those who, historically, have been without the resources or infrastructural means to support such endeavors. However, for all the excitement and optimism that accompanies the initial design and planning, the actual development of the necessary structures and support systems rarely provides the expected return on what, ultimately, becomes a staggering investment of time, money, and labor. In fact, operators have found it nearly impossible to provide for the continued operation, maintenance, and regular occupation of these facilities, thus resulting in an overwhelming burden on the local community.

It is the purpose of this thesis to provide a survey of architectural precedents, from selected mega-events of the last 100 years, as well as a number of other contemporary stadium projects, in an effort to fully convey the magnitude and relevancy of this issue, to identify industry trends and practical models, and more definitively present the need for an alternative approach to design. A brief prescription will be structured so as to emphasize the redefinition of program, within the traditional stadium typology, as well as to advocate a stronger focus on the possible integration of more modular and prefabricated means of construction. It is the hope that the systemic issues, currently associated with sports architecture, may be remedied through the reconceptualization of the 21st Century sports facility. Ultimately, the goal is to reduce the negative impact of such undertakings as building a stadium or hosting an international competition, and to aid in the realization of the inherent potential for positive change therein.

CHAPTER 1

INTRODUCTION

The relevancy of sports, in our modern society, is undeniable. In addition to the amount of money generated by the events themselves, as well as their corresponding merchandise and sponsorship opportunities, sports occupy a great deal of time and space, both within the physical world and across all forms of analog, digital, and social media. They span geographical borders and traverse ideological boundaries, connecting people across both miles and generations. Their stories are told and retold, through the ages, in order to inspire pride, exemplify glory, and instill heartache, in a manner akin to the most renowned tales of old. Heroes and villains live on forever, as legends, as do the memories made each time we are lucky enough to bear witness to the competitive game.

The stadium, the modern-day temple of the sports world, is the focal point of so much that is tied to the greatness and majesty of sport, as well as too much of its controversy, in the greater context of our society. No other building type carries with it such an inherent and passionate degree of sentiment and speculation. Regardless of their level of awareness, everyone is influenced, in some way, by the construction, operation, and maintenance of these structures and their auxiliary facilities. Many of us have experienced the wonder of walking through the turnstiles at our first ballgame or the thrill of hearing the collective roar from thousands of fellow fans. Even those who never set foot on the field, or inside the stadium, however, are sure have some interaction with these structures, whether through the taxes levied for their payment or the inconvenience caused by their construction and the traffic on gameday.

For these reasons and more, sports architecture is becoming an ever-more important issue, within the evolving global landscape of the 21st Century. Therefore, it is vital for the architect to be cognizant of the breadth of humanity's connection to sport, to understand the magnitude of his design decisions on the larger urban environment, and to be able to adapt to the needs of the industry, as a whole.

This paper is meant to serve all three ends by discussing the past, present, and potential future of sports and sports architecture, primarily at the professional and international levels. Through a survey of mega-events and contemporary projects, it will be possible to examine historical precedents, as well as present trends. Based on the information, at hand, it is apparent that the need for an alternative approach is required, one that is willing to physically and conceptually “disassemble” the customary stadium model. Hopefully, through a higher-level understanding of the issues currently facing the industry, we may begin to consider further, more systematized methods of design and construction, with which we may be able to provide for a more universally-accessible model for future success.

CHAPTER 2

GLIMPSE INTO THE PAST

HISTORY OF SPORT

Competitive by nature, humans have come to regard sport as an innate part of our being. Throughout history, athletic competition has been viewed as leisurely activity, dedicated lifestyle and, in some cases, means for survival; it has helped to impart necessary lessons by teaching hunting skills or training for war; and it has represented disparity between peoples, as well as served as the agent which unites them. The first vestiges of athletic activity began appearing in the earliest days of man, himself, and were extremely rudimentary. Since then, sport has evolved into something larger by which we are able define our heritage, our birthright, and our deepest cultural connections (*see Table 2.1*). Over time, its role, in our daily lives, may have changed, due to varying outside influences, but sports continue to captivate us and appeal to our basest instincts.

Despite the crude nature of the representation, the first known records of anything resembling sport exist in the form of paintings, found in the caves at Lascaux, France, which date back almost 17,300 years ago. In fact, numerous such artifacts have been found around the world, including Mongolia (7000BC), Egypt (6000BC), Sumeria (3000BC), and even Meso-America (1000BC), many of which depict athletes at their most primal level (*"History of Sport"*).



Figure 2.1 Prehistoric paintings near (a)Lascaux, France and (b)Cave of Swimmers near Wadi Sura, Egypt

Of the ancient civilizations, it most certainly is the Greeks and Romans who, with their epic tales and festival games, may be attributed with the transforming of athletic competition into what we know it as, today. It is to them that we may trace the origins of modern sport and the modern stadium.

In the 4th Century, through a demonstration of its power, the Catholic Church effectively outlawed all sports for their presumed ties to paganism, thus condemning them to hundreds of years of dormancy. During the Middle Ages and Renaissance, when it finally did experience a resurgence, the scope of sporting activity was limited to the aristocratic displays of valor and strength, inaccessible to the general population, unable to escape the toil and plight of their stature. Colonization, through the 1800s and 1900s, forced a permeation of Westernized sporting sensibility upon other cultures, throughout the known world. With the onset of the Industrial Revolution, as the masses were granted more time for leisurely pursuits, they began to explore and expand their interests in these newfound ventures (*Jarvie*). As popularity increased, particular sports began to establish standardized sets of rules, leading to the formation of organized clubs, professional leagues, and international competitions, many of which still exist.

The advancement of technology has further facilitated a widespread globalization of sport, as the coverage of the mass media has extended its reach worldwide. Additionally, the advent of student athletic programs, numerous acts of legislation (ensuring all manner of athlete equality), and a never-ending stream of grassroots movements, have given everyone on the planet the means to discover sports. Only time will tell what role they will play in our future lives, and to what end we are able to push their boundaries.

Table 2.1 Brief History of Sports and Sports Architecture

YEAR	EVENT
15000BC	Sprinters First Painted On Walls Of Lascaux Caves In France
6000BC	Swimmers And Archers First Painted On Walls Of Wadi Sura Caves In Libya
776BC	First Athletic Competitions At Olympia
50BC	Roman Gladiatorial Contests To The Death Become Prominent
80	Colosseum Inaugurated By Emperor Titus in Rome
393	Ancient Games At Olympia Are Brought To An End By Emperor Theodosius I
1457	First Reference Of Sport That Became Modern Golf In Scotland
1823	Rugby Is Invented By Schoolboy William Webb Ellis
1845	Rules For The Modern Game Of Baseball Are Devised By Alexander Cartwright
1863	The Football Association Holds Inaugural Meeting In London To Establish Unified Rules Of The Game
1868	American Stud Book Prompts The Beginning Of Organized Horse Racing In United States
1869	First American College Football Game Played Between Rutgers And Princeton
1872	One of the First Modern Stadiums is completed at Lansdowne Road, Ireland
1877	First International Cricket Match Held Between England And Australia
1877	First Lawn-Tennis Championships Are Organized By All-England Croquet Club In Wimbledon
1891	Basketball Is Invented By James Naismith
1895	United States Golf Association Stages First National Amateur And Open Championships
1896	Athens Hosts Games Of The Inaugural Modern Olympiad, First Major International Sporting Event On European Continent
1902	First Professional-Amateur Ice Hockey League Forms In Pennsylvania
1903	First Tour De France Is Run Between 15 Competitors
1903	First World Series Of Baseball Is Played Between Nine Teams
1904	St. Louis Hosts Games Of The III Summer Olympiad, First Major International Sporting Event On North American Continent
1906	First Grand Prix Of Motor-Racing Is Held Near Le Mans, France
1924	Chamonix Hosts Games Of The Inaugural Winter Olympiad
1930	Uruguay Hosts Inaugural World Cup, First Major International Sporting Event On South American Continent
1954	Roger Bannister Runs First Ever 4-Minute Mile
1956	Melbourne Hosts Games Of The XVI Summer Olympiad, First Major International Sporting Event On Oceanic Continent
1964	Tokyo Hosts Games Of The XVIII Summer Olympiad, First Major International Sporting Event On Asian Continent
1965	Astrodome (MLB) becomes First Multi-Purpose, Domed Stadium
1967	First World Championship Football Game (aka “Super Bowl”) Is Played
1989	Sky Dome (MLB) becomes First Stadium with Functional, Fully-Retractable Roof
2010	South Africa Hosts World Cup, First Major International Sporting Event On African Continent
2014	Levi’s Stadium (NFL) becomes First Stadium to achieve LEED Certification for New Construction
2022	Qatar To Host World Cup, First Major International Sporting Event In The Middle East

HISTORY OF THE STADIUM

The stadium has not always been an integral element to the sporting experience. For thousands of years, competitions were held without these massive structures, which have now become such an inherent athletic association. Today, however, most of us cannot imagine the sport without the crowd, the camera, and the overall atmosphere that the stadium facilitates. People, all around the world, play with nothing more than a ball, and perhaps a few cones, cannot help but dream of themselves immersed in such an environment. Certainly, even a task as menial as disposing of a piece of paper is not wholly immune to such illusions of grandeur and excitement. Undoubtedly, the stadium has engrained itself within our culture and embedded itself firmly within our subconscious.

The true history of the sports arena begins with the ancient marble stands of the original Panhellenic stadiums, in Greece. Nothing more than an elongated horseshoe, surrounding a linear track, the “stadion” (as it was later known in the Roman world) took its name from the solitary race of the ancient Olympics, only to later signify the tiered arrangement of seating around any playing field, race track, or stage (*Spampinato*). In time, the extensive series of hippodromes, circuses, arenas, and amphitheaters that emerged from these two empires, would help spawn a countless number of iterations, which would subsequently evolve, as the sports they held became ever more popular and complex. Despite this, however, the Roman Colosseum, completed in 80 AD, remains history’s most renowned stadium, to this day.

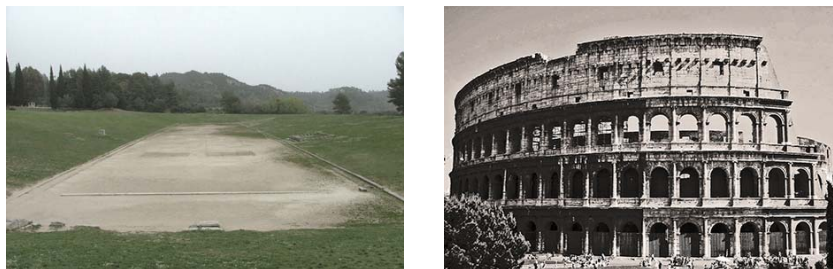


Figure 2.2 As seen today, (a) the Panathenaic Stadium – Athens, Greece and (b) The Colosseum – Rome, Italy

The diminution in sporting activity, between the 4th and 19th Centuries, coincided with somewhat limited developments in the field of sports architecture. Only in the Victorian Era, with the combined forces of the Industrial Revolution, the massive expansion of Western culture, and the establishment of professional leagues and competitions, did stadiums begin to reemerge (*Spampinato*). Like their ancient predecessors, these earliest “modern” stadiums began as small, single-purpose stands, only to expand in all manners of scale, usage, and configurations, into the immense catalog of structures we have today.

So that it is possible to disseminate the various forms which the stadium has taken, they may be broken down into the five categories or “generations”, as follows (*Spampinato*):

- The First Stadium (pre-1950s): Non-homogenous rectangular structures, formed primarily by concrete embankments and few seats, without architectural value or consideration for comfort and safety. Facilities were extremely sparse, and their primary objective focused on packing in as many spectators as possible.



Figure 2.3 (a) Anfield – Liverpool, UK [circa 1904] and (b) White Stadium – London, UK [1908]

- The Equipped Stadium (1950-1980s): With the invention of television, and the threat it imposed to attendance numbers, the provision in basic amenities inspired the installation of seats, roofs, bathrooms, concession stands, and lights. Despite several unique formal achievements, most facilities tended to maintain an “introverted” focus, somewhat anonymous within their greater, respective landscapes, despite their size. Additionally, safety and security continued to be pose issues.



Figure 2.4 (a) Astrodome – Houston, TX [circa 1965] and (b) Arrowhead Stadium – Kansas City, MO [circa 1972]

- The Commercial Stadium (1990s): A truly “public” venue, facilitated an increase in diversity, among visitors and associated businesses, presenting new opportunities for revenue generation. Corporate sponsorships, luxury boxes, restaurants, museums, and other attractions began to appear. Also, the implementation of serious safety measures also became compulsory, following several accidents around the world, involving fire, hooliganism, and structural failure.

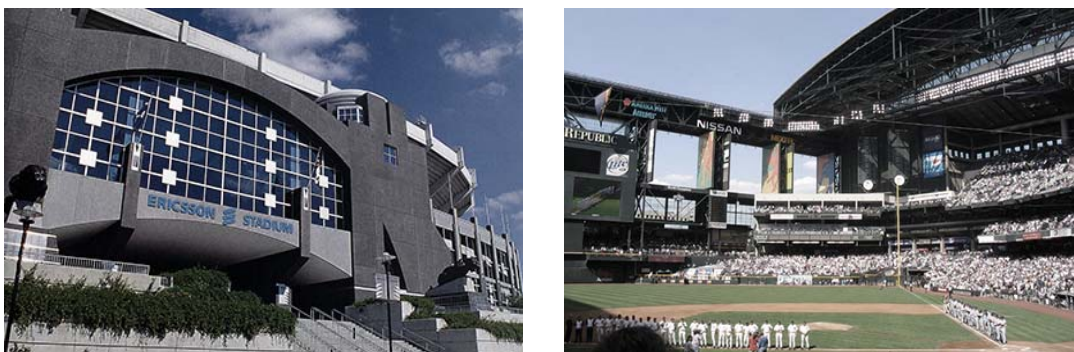


Figure 2.5 (a) Ericsson Stadium – Charlotte, NC [1996] and (b) Bank One Ballpark – Phoenix, AZ [1998]

- The Flexible Stadium (late 1990s-2000s): Mobility in the roof, stands, and playing fields allowed for more off-game, “alternative” tenancies, thus enabling the commercialization of and development in/around the stadium.

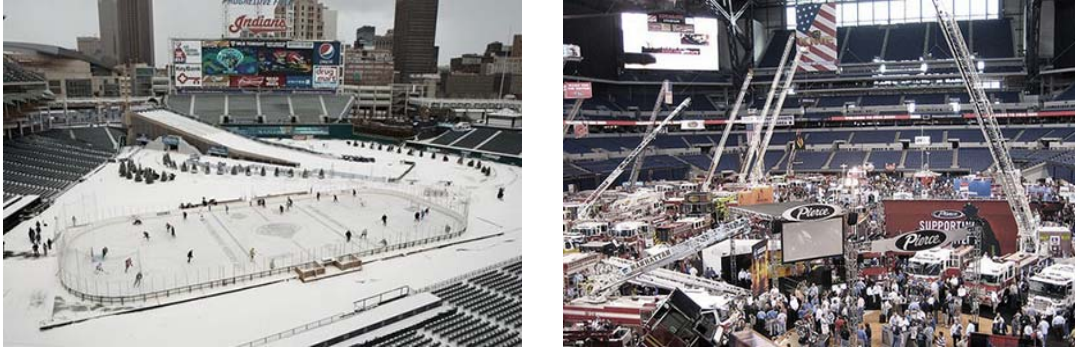


Figure 2.6 (a) Progressive Field hosting city’s annual Winter Wonderland – Cleveland, OH [2011] and (b) Lucas Oil Stadium hosting Fire Department Instructors Conference – Indianapolis, IN [2011]

- The Urban Icon Stadium (2000s): Increased interest and media coverage necessitated the provision of more unique attractions and experiences, within the stadium. Integrated technology and accessibility helped expand the user experience. Architecture became more specialized and experimental, as cities appealed for “iconic” structures and more high-profile architects took on more of these commissions.

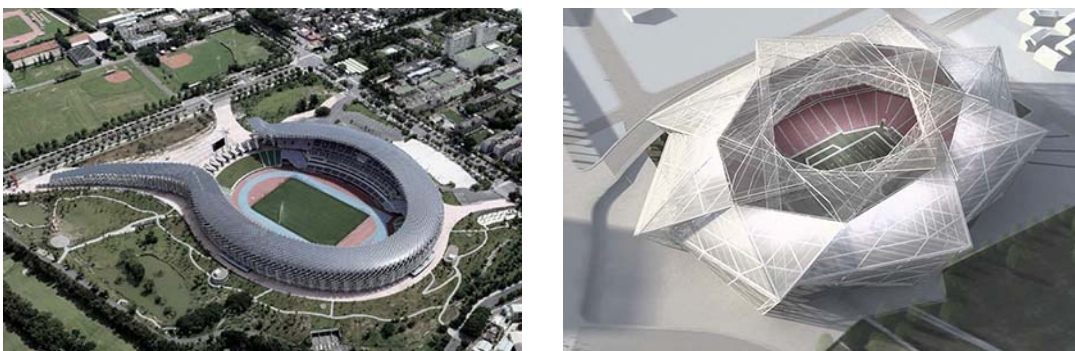


Figure 2.7 (a) Kaohsiung Stadium – Kaohsiung, TW [2009] and (b) Atlanta Falcons Proposal – Atlanta, GA [2013]

The role of the stadium, and its perception within the community, has changed dramatically over the last 150 years, from utilitarian to utopian, and everything in between. As we stand at the precipice of the next generation of sports architecture, however, it is clear that adjustments must be made, if the stadium is to remain a viable and sustainable element, within the urban fabric.

HISTORY OF THE MEGA-EVENT

As the world gets smaller, the ability to share information and cultural ideas becomes easier, and sports have, not only been a product of this trend, they have helped continue it. Mega-events, such as the Olympic Games and World Cup, have brought us closer together, by championing that which is constant across all languages, beliefs, and nationalities.

Researcher Maurice Roche has defined mega-events as those “which have a dramatic character, mass popular appeal and international significance” (*Roche*), while John Horne, of the University of Edinburgh, describes them as those which simply “have significant consequences for the host...and attract considerable media coverage” (*Horne*). In architectural terms, however, these competitions can serve as snapshots for the larger challenges and opportunities which present themselves to the larger sports industry, as a whole. Each is an expression of entrepreneurialism, at the city scale (*Minnaert*); an accelerated microcosm, in itself, facing the same issues as any other massive project, but on a much more rigid timeline, at a much grander scale, and with a great deal more stakeholders. Therefore, it is necessary to provide an overview of their history, as well as an investigation of certain case studies, in order to recognize their influence and to learn from their successive legacies.

THE OLYMPIC GAMES

There exists an extensive history of religious and athletic festivals, prior to the ancient competitions held at Olympia, nevertheless, it is these that provide the basis by which sports, in the ancient world, are measured. Alongside the other Panhellenic games Delphi, Nemea, and Corinth, the Olympic Games were run for over a millennia, ultimately featuring events in track & field, horse racing, and combat (*Gordon*). Owing to the 4th Century ban, however, sports and the Olympic Games faded from prominence, for many years.

Beginning in the 17th Century, a number of various attempts were made to re-establish international sporting competitions, however, most were limited in their size and scope. Even when a French nobleman, by the name of Pierre de Fredy, Baron de Coubertin, successfully petitioned for the formation of an International Olympic Committee (IOC), in 1894, a certain amount of speculation persisted. After two years of planning, programming, and preparation, however, the inaugural modern Olympic Games was opened in Athens. Held at the very same Panathenaic Stadium of ancient times, 241 athletes, from fourteen countries, competed in forty-three events (*Miller*). Despite its modest beginnings, and a few initial difficulties, the competition laid the foundation for, what would ultimately become, a series of the most captivating and inclusive sports spectacles ever seen, within the global community (*see Appendices A & B*).

One of the most powerful and effective strategies which has persisted throughout the history of the modern Olympic Games, and that which has helped make them so successful, has been the ability to forge it into an identifiable brand. The creation of the official Olympic flag in 1914, became the first step in defining an independent, and enduring, culture for the Games.

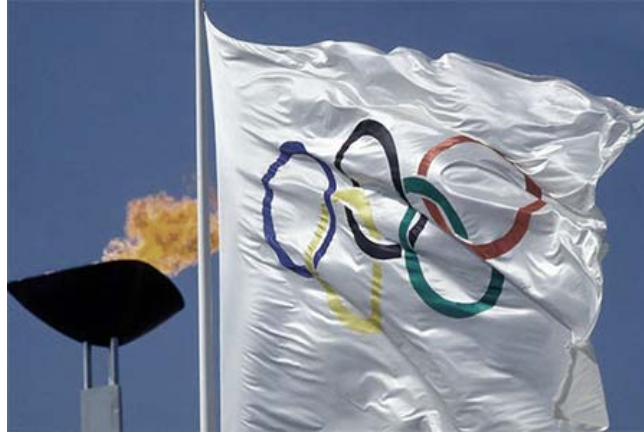


Figure 2.8 The Olympic Flag (containing one ring for each continent and at least one color from each nation's flag)

Subsequently, addition of opening and closing ceremonies (1920), the inaugural Winter Olympics (1924), the Olympic Village (1932), the torch relay (1936), and the Olympic mascot (1968) have all contributed to the foundation of that which remains most distinctive and influential within its modern identity (*Gordon*). The events were first broadcast, on local television, in Berlin, in 1936; international broadcasting began at Melbourne 1956 (with satellites first being used at Tokyo 1964); and the 1968 Games in Mexico City, saw the first broadcasts in color. Corporate sponsorship and the sale of TV rights became an integral part of the event, beginning at Munich 1972, although the first truly commercially profitable Olympics did not come until Los Angeles, in 1984. Professional athletes officially became eligible in all sports (except for boxing and wrestling) at Seoul 1988, and the Games in Lillehammer, in 1994, began the transition to a two-year alternating schedule (*Miller*). Each of these successive decisions and innovations have helped expand the global influence of the Games and allowed them to continually reach even newer heights and broader audiences.

From the time of the first modern games, there have been a number of obstacles and controversies, including two world wars, multiple terrorist attacks, several boycotts, and various degrees of success, from the standpoint of the host cities. Over the course of more than 100 years,

however, the Olympic Games have developed into one of the most widely watched and most easily recognizable icons of sports excellence in the world. From such a humble beginning, in Athens, with only a few hundred strong, the participation numbers continue to grow, and the most recent Olympics respectively set new records.

Table 2.2 Demographics from the most recent Olympic Games

EVENT	PARTICIPATION	PARTICIPATION	EVENTS	SPORTS
London 2012	10,520	205	302	32
Sochi 2014	2,536	82	86	15

It is clear that, although there exist issues within the global community, which extend far beyond the realm of sporting competition, the Olympics have been steadfast in their quest to promote unity and cooperation amongst all nations and people of the world. With the introduction of the Paralympic Games, in 1948, and Youth Games, in 2010 (*Miller*), they have certainly expanded and enriched the world's interconnection through sport. This, perhaps, is what has allowed them to become such an enduring force in the world today, and one that remains attractive for the competitors, spectators, and organizers alike.

THE FIFA WORLD CUP

Like the Olympic Games, football (or “soccer”) can be traced back to antiquity, and in order to understand the magnitude and depth of interest, around the globe, it is necessary to briefly recount its history. Variations of the sport have been linked to the oldest societies, across every continent, however the rules for, what would eventually become, the modern game were ratified in a small London tavern, in 1863. Accordingly, the first formalized football tournament (FA Cup) was held in 1872 and the first international game (England versus Scotland) in 1884, but it was not until 1888, that the first professional league was formed, and 1900, when football became an official Olympic sport (“*History of the Game*”). In 1904, the Fédération Internationale de Football Association (FIFA) was established in Paris and was charged with forming its own football-specific international event. Despite failed attempts in 1904, 1909, and 1914, FIFA successfully organized the first World Cup in 1930, in Uruguay (“*FIFA*”) and continues to manage the tournament on an alternating four-year schedule (*see Appendix C*).

Originally designed as a sixteen-team, invitational, the tournament structure has stayed relatively consistent throughout its history. Variations to the overall format of the competition include the pre-tournament qualification system, beginning with Italy 1934, a round-robin semi-final system, during Brazil 1950, and the brief implementation of the “golden goal” rule, at France 1998. Of them all, however, the most marked alteration to the competition has come in a series of expansions to the field of competitors (up to twenty-four teams, at Spain 1982, and thirty-two, in 1998), which, in turn, increased the demand on the host nation for adequate stadium facilities. As with the Olympics, the introduction of the international television broadcast allowed the event to reach ever more people around the world, as well as spark new interest in previously limited

markets (for example, USA 1994 remains the most highly-attended in history, and helped launch, the now-widely successful, Major League Soccer).

Today, FIFA exists as a collective of 208 nations, overseeing as many as 265 million people who play the sport, at all levels, around the world (*Kunz*). Football can claim the largest TV audience in sports, and even though only eight teams have won it, the World Cup has dominated the attention of the international community as almost no other competition can. It, too, has developed into a serious catalyst for development and infrastructural improvement, with potential hosts are looking to it to explore their own ambitious interests and fulfill their own urban agendas.

CASE STUDIES

The task of hosting an international mega-event is an honor that is only extended to a limited few, despite being sought after by many. Due to the scale of such a proposal, as well as the sheer number of people involved, however, the procedures for even submitting a bid carry with them a great deal of onerous preparation and consideration (*Rose*).

Others will discuss the fiscal and social responsibility of such an undertaking, but in purely architectural terms, it is nothing more or less than an opportunity to pronounce one's self on the international stage and to address any greater infrastructural ambitions, which may be simultaneously achieved. Debates have raged over the incentives and consequential outcomes of hosting a mega-event, the following arguments summarize the most pertinent:

Table 2.3 Potential Outcomes of Hosting Olympic Games

POSITIVE IMPACTS	NEGATIVE IMPACTS
Economic and Urban Development Expanded Trade Activity Improved Physical and Mental Health Increased Philanthropy from Local Businesses Pride and Sense of Place Social Capital	Displacement of Local Population Excessive Expense Long-Term Economic and Social Difficulties Over-Expansion/Over-Utilization

Over the years, many approaches have been made toward the ultimate design and implementation of such spectacles. Some have adhered to the strictest codes of asceticism, while others have used the occasion as a display of power or opulence, and then some have successfully used them to pursue more urban development goals, while others have mismanaged them, resulting in a deep state of debt or disrepair (*Hawthorne*). The following is a selection of brief case studies, from past Olympic Games and World Cups, with specific examples chosen to demonstrate the full spectrum of design tactics taken, as well as the most extreme legacies left behind.

BERLIN 1936 (GAMES OF THE XI OLYMPIAD)

Built on the foundations of the proposed stadium for the 1916 Olympics (which were cancelled due to World War I), Berlin '36 was the first Games to be televised or filmed, and the Germans used it as the ultimate propaganda tool. The main stadium's neo-Classical design, and several incorporated elements were meant to convey an impressive sense of solidity and authority, for the international community (*Essex*). Following the Olympics, the stadium served as the post-war headquarters for the British army, before becoming the permanent home of a professional football team, as well as host venue for multiple future mega-events. Its fate was contested in the 1990s, due to previous associations with sensitive matters, but the structure was ultimately preserved, restored, and renovated.



Figure 2.9 Olympiastadion Berlin (a) in 1936 and (b) circa 2012

Main Stadium: Olympiastadion Berlin

Architects: Werner March and Albert Speer

Construction Dates: March 1934 – July 1936

Construction Cost: DM 30,000,000

Materials: Concrete, Steel, and Marble

Building Type: New Construction

Original Use: Equestrian jumping, football, and handball events

Original Capacity: 110,000 (65,000 seated)

Additional Mega-Event Uses: FIFA World Cup (1974, 2006) and UEFA Champions League Final (2015)

Renovation Dates: 1974 (added Plexiglas/steel roof), 2006 (converted roof to Teflon/steel)

Current Tenant: Hertha BSC (German Bundesliga)

Current Capacity: 74,064

LONDON 1948 (GAMES OF THE XIV OLYMPIAD)

Deemed the “Austerity Games,” due to severe rationing and post-war limits, organizers focused more on rebuilding the city’s infrastructure than erecting new Olympic facilities. Several events were held at existing venues, and no village was constructed, with athletes housed in local university dormitories. The Empire Stadium was chosen, as the main stadium, for its size and proximity to the rapidly-developing metropolitan Underground system (“1948”). Although regularly occupied for only brief periods, beyond the Olympic Games, it served as home for a number of important domestic and international events, and the twin tower design would become iconic for British national football. Demolished in 2003, the rubble from “Old Wembley” was used as part of the earthwork for a newly-developed country-style park, erected in its place.



Figure 2.10 Empire Stadium (a) in its heyday [circa 1940] and (b) its demise [2003]

Main Stadium: Empire Stadium (*renamed Wembley Stadium*)

Architects: Sir John William Simpson and Maxwell Ayrton

Construction Dates: January 1922 – April 1923

Construction Cost: £750,000

Materials: Concrete (25,000+ tons), Steel (1,400 tons), Ballast (40,000 tons), and more than 1 million Iron Rivets

Building Type: Existing

Original Use: British Empire Exhibition of 1924

Original Capacity: 127,000

Additional Mega-Event Uses: FIFA World Cup (1966), UEFA European Cup Finals (1963,1968,1971,1978,1992), English FA Cup Final (1923 – 2000), Live Aid (1985), UEFA European Championship (1996)

Renovation Dates: 1948 (new track and new road from Wembley Tube Station), 1955 (added lights), 1966, 1996

Current Status: Closed (2000) and Demolished (2003)

MONTREAL 1976 (GAMES OF THE XXI OLYMPIAD)

Despite the formal success of its “Organic Modern” architecture, as well as of its neighboring Montreal Tower, the legacy of the Canada’s largest stadium remains its tribute to the largest financial failure in Olympic Games history (the C\$1.6 billion debt was only paid off in 2006). Continual setbacks, most notably not being completed in time for the opening ceremonies, forced a number of design changes and repairs (*Essex*). Although once home to multiple professional teams, the stadium was poorly positioned within the city and its life after the Olympics has been fraught with issues. In 2009, the structure was ultimately deemed unsafe for conditions of heavy rain or snowfall, and it is currently seeking a regular tenant.



Figure 2.11 Olympic Stadium (a) incomplete at the opening ceremonies [1976] (b) and unoccupied [circa 2012]

Main Stadium: Montreal Olympic Stadium (nicknamed “The Big O”)

Architect: Roger Taillibert

Construction Dates: April 1973 – July 1976 (tower and roof not completed until 1987)

Construction Cost: C\$ 264,000,000 (ultimately rose to C\$770,000,000)

Materials: Concrete, Steel, and Kevlar (66 tonnes for the 59,000ft² roof)

Building Type: New Construction

Original Use: Opening/Closing ceremonies, equestrian and football events

Original Capacity: 78,322

Additional Mega-Event Use(s): FIFA Under-20 World Cup (2007)

Renovation Dates: 1988 (retractable roof), 1991, 1998 (Kevlar replaced), 1999

Current Tenant: Unoccupied (Montreal Expos through 2004)

Current Capacity: 65,255

LOS ANGELES 1984 (GAMES OF THE XIII OLYMPIAD)

In stark contrast to its predecessors, the Olympics in Los Angeles epitomized the potential commercial success which hosting could provide. A majority of the funding was provided by private investment; most venues, including the main stadium (which had been used for the same purpose 52 years previously), were pre-existing; and any built-structures were either recycled or temporary (*Essex*). Despite its early controversies and boycotts, the Games became much more about the celebration of the event, as opposed to the fulfillment of civic agenda, and for it, the organizers were able to turn a profit, albeit at the expense of any larger infrastructural opportunity. The Coliseum would go on to host several professional and international events, but is currently home to one of the most prestigious college football programs in the country.



Figure 2.12 Los Angeles Memorial Coliseum as (a) Olympic host [1984] and (b) home to USC Trojans [2012]

Main Stadium: Los Angeles Memorial Coliseum

Architects: John and Donald Parkinson

Construction Dates: December 1921 – May 1923

Construction Cost: \$954,873

Materials: Concrete, Steel, and Marble

Building Type: Existing

Original Use: Opening/Closing ceremonies for Los Angeles 1932

Original Capacity: 101,573

Additional Mega-Event Use(s): X Summer Olympic Games (1932), NFL Pro Bowl (1951 – 1972, 1979),
MLB World Series (1959), NFL-AFL Championship/Super Bowl (1967, 1973),
Speedway World Final (1982)

Renovation Dates: 1964, 1984, 1993, 2010, 2013 (99-year lease signed, promising \$100M renovations)

Current Tenant: University of Southern California Trojans (NCAAF)

Current Capacity: 93,607

BARCELONA 1992 (GAMES OF THE XXV OLYMPIAD)

The legacy of the Barcelona Olympics lies in its immense success using the Games to spark a complete redevelopment of a derelict, post-industrial area of the city. Although by no means a benchmark of frugality (the cost of so many renovated or newly-built venues remains one of the highest ever), several square miles of green space and beachfront development were created, numerous new roads were paved, and an extensive sewer network was laid. These improvements essentially resulted in a virtual advertisement for the city and have seriously contributed to the rejuvenation of Barcelona's tourism industry (*Abrahams*). Despite a complete restoration before the Games, however, the main stadium, itself, has only been able to sustain sporadic tenancy (currently a professional rugby team) and minimal usage for other major events.



Figure 2.13 (a) *Estadi Olímpic de Montjuïc [1992]* and (b) *Estadi Olímpic Lluís Companys [2012]*

Main Stadium: Estadi Olímpic de Montjuïc (renamed *Estadi Olímpic Lluís Companys*)

Architect: Pere Domenech I Roura

Construction Dates: 1927 – 1929

Construction Cost: Unknown

Materials: Concrete, Steel, and Marble

Building Type: Existing

Original Use: 1936 International Exposition

Original Capacity: 67,007 (1992)

Additional Mega-Event Use(s): Copa del Rey Final (1930, 2004), II Mediterranean Games (1955), Spanish Grand Prix (1975), IAAF World Cup (1989), 20th European Athletics Championships (2010), World Junior Championships in Athletics (2012)

Renovation Dates: 1989 (stadium gutted, except for facades)

Current Tenant: Catalan Dragons (Rugby Super League)

Current Capacity: 55,926

USA 1994 (WORLD CUP XV)

Through the strategic management of available capital, as well as its existing resources, the United States was able to achieve the highest total and average attendance for any World Cup Finals in history. Its well-developed network of transportation and infrastructure, as well as its use of an array of college and professional (American) football stadiums, allowed for more focus on logistics and necessary renovations. Although no new major structures were erected, most of the venues have been sufficiently maintained to continue supporting regular sporting and non-sporting tenants, while two have since been replaced.

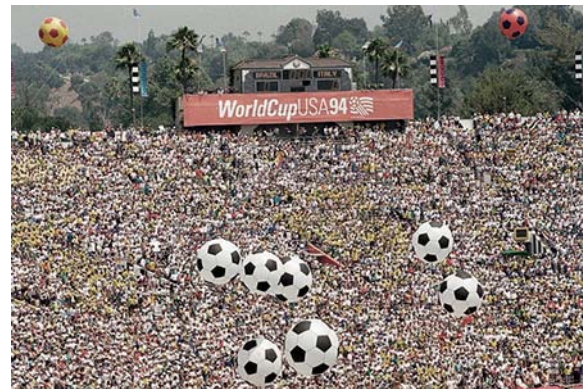


Figure 2.14 USA '94 (a) opening ceremonies and (b) the final game [1994]

Stadium: Citrus Bowl

Location: Orlando, Florida (*Planned Reconstruction in 2015*)

Date Opened: 1936

Capacity: 61,219

Construction Cost: \$115,000

Building Type: Existing

Architect: Architect Unknown

Current Tenant: Orlando SC (MLS) beginning in 2015

Stadium: Cotton Bowl

Location: Dallas, Texas

Date Opened: 1930

Capacity: 63,998

Construction Cost: \$328,000

Building Type: Existing

Architect: Architect Unknown

Current Tenant: College Football and Texas State Fair

Stadium: Foxboro Stadium

Location: Foxborough, Massachusetts

Date Opened: 1971

Capacity: 53,644

Construction Cost: \$7,100,000

Building Type: Existing

Architect: David M. Berg Associates

Current Tenant: Demolished 2002

Stadium: Giants Stadium

Location: East Rutherford, New Jersey

Date Opened: 1972

Capacity: 75,338

Construction Cost: \$78,000,000

Building Type: Existing

Architect: Kivett and Myers, Clauss and Nolan, et al.

Current Tenant: Demolished 2010

Stadium: Pontiac Silverdome
Location: Pontiac, Michigan
Date Opened: 1973 (*Closed 2006, Reopened 2010*)
Capacity: 77,557
Construction Cost: \$55,700,000
Building Type: Existing
Architect: O'Dell/Hewlett and Luckenbach
Current Tenant: Conventions and Large Events

Stadium: Rose Bowl
Location: Pasadena, California
Date Opened: 1922
Capacity: 91,794
Construction Cost: \$273,000
Building Type: Existing
Architect: Myron Hunt
Current Tenant: U of California at Los Angeles Bruins (NCAAF)

Stadium: Stanford Stadium
Location: Stanford, California
Date Opened: 1921
Capacity: 80,906
Construction Cost: \$200,000
Building Type: Existing
Architect: Unknown
Current Tenant: Stanford University Cardinal (NCAAF)

Stadium: Robert F. Kennedy Memorial Stadium
Location: Washington, D.C.
Date Opened: 1961
Capacity: 53,142
Construction Cost: \$24,000,000
Building Type: Existing
Architect: George L. Dahl, Osborn Engineering, et al.
Current Tenant: DC United (MLS)

Stadium: Soldier Field
Location: Chicago, Illinois
Date Opened: 1924
Capacity: 63,117
Construction Cost: \$13,000,000
Building Type: Existing
Architect: Holabird and Roche, Wood and Zapata, et al.
Current Tenant: Chicago Bears (NFL)

ATLANTA 1996 (GAMES OF THE XVI OLYMPIAD)

Organizers employed a number of new and existing venues around the city, as well as around the southeast United States. Despite attempts to follow Barcelona's lead, less emphasis was placed on public areas and revitalizing impoverished neighborhoods, and unfortunately, Atlanta '96 is remembered predominantly for its over-commercialization (*Essex*). The main Olympic stadium, fortunate enough to have a long-term tenant in place, was re-configured after the event, so as to support a professional baseball team. However, the original twenty-year lease agreement is due to expire in 2016, and with the franchise moving elsewhere, the future of the stadium remains in question. To remedy much of the initial displacement of the local population, a proposal has been made for its demolition and the return of the land to the community.



Figure 2.15 (a) Centennial Olympic Stadium [1996] and (b) Turner Field [2013]

Main Stadium: Centennial Olympic Stadium (*renamed Turner Field*)

Architects: Heery International, Rosser International, Williams-Russell and Johnson, Ellerbe Becket

Construction Dates: July 1993 – May 1996 (*reconstruction finished in March 1997*)

Construction Cost: \$209,000,000

Materials: Concrete, Steel, and Brick Masonry

Building Type: New Construction

Original Use: Closing ceremonies, track and field events

Original Capacity: 85,000

Additional Mega-Event Use(s): MLB World Series (1999) and MLB All-Star Game (2000)

Renovation Dates: 1996 (seating and track removed, as part of conversion to professional baseball stadium), 2005

Current Tenant: Atlanta Braves (MLB)

Current Capacity: 49,600

BEIJING 2008 (GAMES OF THE XXIX OLYMPIAD)

China poured a great deal of time, money and resources into developing the infrastructure capable of supporting the country's largest-ever event. Like Berlin, before it, Beijing intended to use the Olympics as a means to impress the world, with the scale and scope of its expenditure (*Kelso*). In addition to massive commercial development, a number of new venues were built, with the main stadium serving as the crown jewel. Unfortunately, since the end of the Olympics, most of these structures, and several entire cities have been left abandoned or unused, with many falling into a state of disrepair. The National Stadium currently hosts more tourists than sports fans, and the legacy of these Games lies in the country's glaring social polarization and disparity between China expectation and reality (*Broudehoux*).

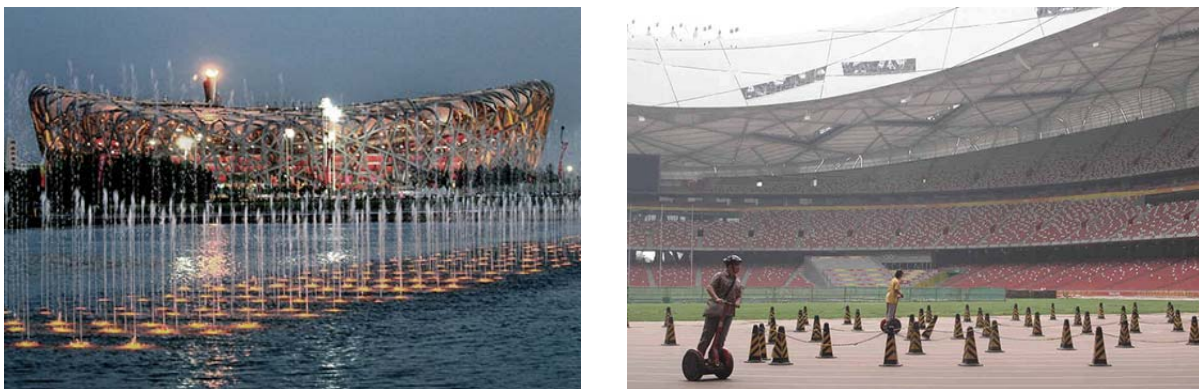


Figure 2.16 Beijing National Stadium (a) during the Games [2008] and (b) its legacy [2013]

Main Stadium: Beijing National Stadium (“the Bird’s Nest”)

Architects: Herzog & de Meuron, China Architectural Design and Research Group, Ai WeiWei (consultant)

Construction Dates: 2003 – 2008

Construction Cost: ¥2,900,000,000

Materials: Concrete and Steel (45,000 tons)

Building Type: New Construction

Original Use: Opening/Closing ceremonies, track & field and football events

Original Capacity: 91,000

Additional Mega-Event Use(s): SuperCoppa Italiana (2009, 2011-2012), World Championships in Athletics (2015)

Renovation Dates: 2008 (temporary seats removed)

Current Tenant: Unoccupied (tourist attraction)

Current Capacity: 80,000

SOUTH AFRICA 2010 (WORLD CUP XIX)

No more unfortunate legacy could be found than that of the World Cup in South Africa. The first mega-event on the African continent, it was touted as the quintessential opportunity for a developing country to emerge and pioneer a new “humanitarian mega-event” model (*Hiller*). Despite its economic position, massive renovations were undertaken at five existing stadiums, while an additional five new stadiums were constructed. The billions in costs, as well as the effects of the resultant displacement of thousands, still remain apparent, and although each of the venues is able to sustain a permanent tenant, high maintenance costs and low average attendance place a heavy load on the already overladen nation.



Figure 2.17 (a) Opening ceremonies at Soccer City Stadium [2010] and (b) the local fan base

Stadium: Cape Town Stadium

Location: Cape Town

Date Opened: 2009

Capacity: 64,100

Construction Cost: ZAR 4.4 Billion

Building Type: New Construction

Architect: GMP Architects, Louis Karol Architects, et al.

Current Tenant: Ajax Cape Town (ABSA Premiership)

Stadium: Ellis Park Stadium

Location: Johannesburg

Date Opened: 1928

Capacity: 55,686

Construction Cost: ZAR 40 Million (*for Renovation*)

Building Type: Existing

Architect: Architect Unknown

Current Tenant: Orlando Pirates (ABSA Premiership)

Stadium: Free State Stadium
Location: Bloemfontein
Date Opened: 1952
Capacity: 40,911
Construction Cost: ZAR 245 Million (*for Renovation*)
Building Type: Existing
Architect: Architect Unknown
Current Tenant: Bloemfontein Celtic (ABSA Premiership)

Stadium: Mbombela Stadium
Location: Nelspruit
Date Opened: 2009
Capacity: 40,929
Construction Cost: ZAR 1.05 Billion
Building Type: New Construction
Architect: R&L Architects
Current Tenant: Pumas (Currie Cup Rugby)

Stadium: Nelson Mandela Bay Stadium
Location: Port Elizabeth
Date Opened: 2009
Capacity: 42,486
Construction Cost: ZAR 2.05 Billion
Building Type: New Construction
Architect: Architectural Design Associates Ltd, et al.
Current Tenant: Southern Kings (Super Rugby)

Stadium: Royal Bafokeng Stadium
Location: Rustenburg
Date Opened: 1999
Capacity: 38,646
Construction Cost: ZAR 120 Million
Building Type: Existing
Architect: BSP Architects
Current Tenant: Platinum Stars (ABSA Premiership)

Stadium: Loftus Versfield Stadium
Location: Pretoria
Date Opened: 1906
Capacity: 42,858
Construction Cost: Cost Unknown
Building Type: Existing
Architect: Architect Unknown
Current Tenant: Mamelodi Sundowns (ABSA Premiership)

Stadium: Moses Mabhida Stadium
Location: Durban
Date Opened: 2009
Capacity: 62,760
Construction Cost: ZAR 3.4 Billion
Building Type: New Construction
Architect: GMP Architects, Theunissen Jankowitz, et al.
Current Tenant: AmaZulu FC (ABSA Premiership)

Stadium: Peter Mokaba Stadium
Location: Polokwane
Date Opened: 2010
Capacity: 41,733
Construction Cost: ZAR 1.24 Billion
Building Type: New Construction
Architect: Prism Architects, Schalk van der Merwe, et al.
Current Tenant: Limpopo Black Leopards (ABSA Premiership)

Stadium: Soccer City
Location: Johannesburg
Date Opened: 1989
Capacity: 84,490
Construction Cost: ZAR 3.3 Billion
Building Type: Existing
Architect: Boogertman & Partners, HOK Sport
Current Tenant: Kaizer Chiefs (ABSA Premiership)

LONDON 2012 (GAMES OF THE XXX OLYMPIAD)

Several of the structures built for this, the third, London Olympics, were intended to form part of the most-extensive, long-term urban renewal effort in the history of the Games. Centered in a neglected industrial neighborhood, these venues were designed for adaptation and a post-Games transition back to the local community. Although quite successful within the bounds of the Olympics, the main stadium, deemed the “anti-Bird’s Nest” (*Hawthorne*), has continually been derided for its apparent simplicity and lack of aesthetic ambition, not to mention the \$300 million cost to be reconfigured for professional football (*Lyall*). Unfortunately, there continues to be a great deal of controversy surrounding rising real estate values, the legitimacy of leaseholders’ stakes, and the viability of reusing certain components, thus its legacy remains in question.

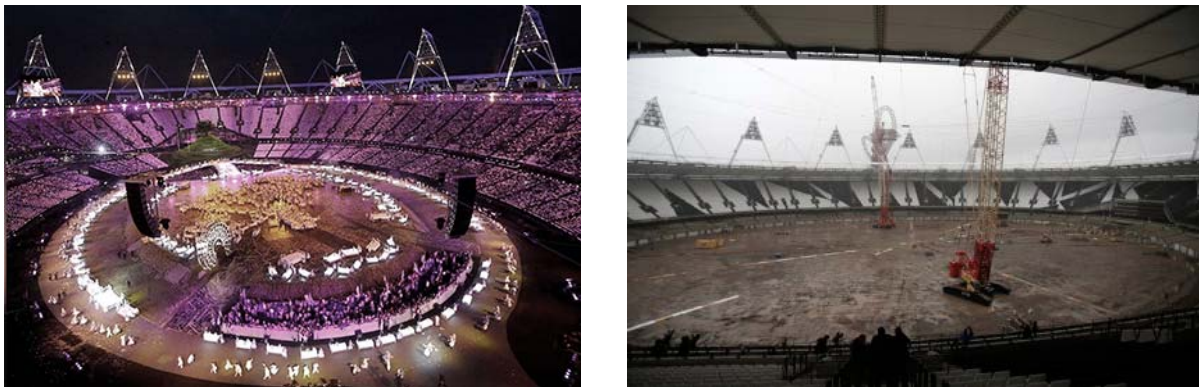


Figure 2.18 Olympic Stadium during the (a) opening ceremonies [2012] and (b) its post-event conversion [2013]

Main Stadium: Stadium at Queen Elizabeth Olympic Park

Architect: Populous

Construction Dates: May 2007 – October 2011

Construction Cost: £486,000,000

Materials: Low CO₂ Concrete, Steel (10,700 tons), Recycled Granite, Re-used Gas Pipeline, and Phylate-Free Polyester Polyethylene Fabric (for the roof enclosure)

Building Type: New Construction

Original Use: Opening/Closing ceremonies, track & field events

Original Capacity: 80,000

Additional Mega-Event Use(s): London Athletics Grand Prix (2013), Rugby World Cup (2015), IPC Athletics World Championships (2017), IAAF World Championships in Athletics (2017)

Renovation Dates: 2013-2016 (upper bowl removal, as part of conversion to professional football stadium)

Current Tenant: West Ham FC (BPL) beginning in 2016

Current Capacity: 54,000 (projected)

SOCHI 2014 (XXII OLYMPIC WINTER GAMES)

As part of a larger initiative to develop a summer resort town into the home of the world's biggest Winter sports exhibition, organizers have spent more money, than anyone previously, on an event of this magnitude. Paramount to the overall planning were security and sustainability, all in an effort to foster the extensive network of new roads, sewer lines, and power plants (*Farhi*). Unfortunately, these Games are already ridiculed for the controversial inability of the organizers to complete a large majority of facilities. The main stadium, with its massive steel structure and Ethylene tetrafluoroethylene (ETFE) panels, intends to play host to the next World Cup, as well as a professional football team (when its capacity will be reduced by half). Hopefully, there will be time for restitution.



Figure 2.19 Fisht Olympic Stadium (a) under construction [2012] and (b) during the opening ceremonies [2014]

Main Stadium: Fisht Olympic Stadium

Architect(s): Populous

Construction Dates: 2009 – 2013

Construction Cost: \$779,000,000

Materials: Concrete, Steel, and Ethylene tetrafluoroethylene (ETFE)

Building Type: New Construction

Original Use: Opening/Closing ceremonies

Original Capacity: 40,000 (flexible up to 45,000)

Additional Mega-Event Use(s): FIFA World Cup (2018)

Renovation Dates: 2018 (seating will be removed to accommodate local football club)

Current Tenant: Russian National Sports

Renovated Capacity: 25,000 (proposed, following 2018 World Cup)

The consequence of globalization has been an enormous shift of people, capital, and resources, prompting an intense competition for attention, influence, and investment (*Zhang*). Hosting an international competition, such as the Olympics or World Cup, has become one of the most assured opportunities for the entrepreneurial city or country, to jump into the international spotlight, and is thus a highly sought after and desirable privilege. The brotherhood of cities, who have hosted a mega-event, remains relatively small, and while there exists no single definition or genre of the “event” city there most certainly are signatures, both good and bad (*Essex*).

Since the Rome Olympics, in 1960, urban development has remained at the forefront of the planning initiative for many mega-events (*Hiller*). As has been demonstrated here, all manner of approaches have been taken, with any number of objectives realized. The level of inconsistency in the success of these subsequent hosts has been in their various ability to properly balance the needs of the competition with those of the city. Having so many stakeholders invested in these projects, it is understandable how certain decisions may be mismanaged. One thing is certain, however. Though these events may be short in duration, their impact and meaning extends far beyond the closing ceremonies (*Minnaert*). Long-term success or failure is defined by an event’s relationship to the urban process and to the economic redevelopment it encourages (*Hiller*), and while it should neither be considered an isolated incident nor a “silver bullet” remedy (*Zhang*), a mega-event can provide a major service in the fulfillment of a great action plan.

CHAPTER 3

VIEW OF THE CURRENT SITUATION

An examination of history helps provide some insight into the magnitude of our connection to with sport and its resultant impact on an entire genre of architecture. Unfortunately, this reveals little of the true nature of the present task and, thus, must be augmented with an understanding of the world, as it presently stands. This may be accomplished by viewing the currently situation, through a series of different lenses.

THROUGH THE LENS OF SPORT

The increased popularity of sport, worldwide, through expanded television and internet coverage, has opened up previously inaccessible, and hitherto untapped, markets. Viewership numbers are higher than ever before,

Table 3.1 Worldwide Fan Demographics, by sport

RANK	SPORT	ESTIMATED FANS	REGIONAL POPULARITY
1	Soccer / Association Football	3.5 Billion	Europe, Africa, Asia, America
2	Cricket	2.5 Billion	Asia, Australia, UK
3	Field Hockey	2.1 Billion	Europe, Africa, Asia, Australia
4	Tennis	1 Billion	Europe, Asia, America
5	Volleyball	900 Million	Europe, Australia, Asia, America
6	Table Tennis	850 Million	Europe, Africa, Asia, America
7	Baseball	500 Million	America, Japan
8	Golf	450 Million	Europe, Asia, America, Canada
9	American Football	400 Million	Europe, Africa, Asia, America, Australia
10	Basketball	400 Million	America

and international participation continues to rise.

Table 3.2 Worldwide Participation, by sport

RANK	SPORT	PARTICIPANTS WORLDWIDE*	AFFILIATED NATIONAL FEDERATIONS
1	Volleyball	1.1 Billion	218
2	Basketball	438 Million	211
3	Table Tennis	329 Million	186
4	Soccer	265 Million	204
5	Badminton	219 Million	147
6	Tennis	66 Million	191
7	Baseball	66 Million	110
8	Boat Racing	55 Million	51
9	Team Handball	20 Million	147
10	Hockey	3.3 million	118

**estimated from 2002 figures*

Additionally, professional sports leagues, of all sorts, are being established in almost every major country, throughout the world (*see Appendix D*), as the earning potential has reached multi-billion dollar levels.

Table 3.3 Annual Global Revenue for Top 4 Major Professional Sports (in 2009)

LEAGUE	REVENUE
European Football	\$27.2 Billion
National Football League (NFL)	\$8.1 Billion
Major League Baseball (MLB)	\$7.7 Billion
National Basketball Association (NBA)	\$3.8 Billion

Organizations like FIFA and the IOC have identified these trends as evidence enough to expand their own reach and pursue newer, more developing countries as hosts for the most recent run of international tournaments and competitions (*Miller*). Consequently, this situation presents an interesting set of cultural initiatives, as well as an equally exciting series of opportunities. It can be assured that, in moving forward, the outcomes of these events will be important in the continued growth of local markets, as well as the long-term success of all industries involved.

THROUGH THE LENS OF SPORTS ARCHITECTURE

Stadium design, in the 21st Century, has become a complex and multifaceted challenge. Like the skyscraper before it, the stadium is quickly becoming a major figure within the realm of urban development and, as such, is attracting a great deal of esteem, as well as scorn. As stated earlier, we stand at the precipice of the next generation of sports architecture. Currently, in the world, there exist at least fifty stadiums with capacities of over 100,000 and a half-dozen whose construction cost exceeded \$1 billion each (*see Appendix D*). With so much at stake, and so many people involved, it is becoming more and more necessary to examine the issues facing sports architecture today.

From a number of publications and conversations, with a variety of industry professionals (*see References*), it has been determined that what will define this future class of projects will be their response to the following topics:

- Urban and Economic Impact
 - Renovation vs. new construction
 - Integrated vs iconic role within the city
 - Management of existing local resources
 - Displacement and the balance of social networks
- User Experience
 - Stadium atmosphere
 - Integrated technology and opportunities for “collective immersion”
 - Security and accessibility

- Sustainability (*see Appendix E*)
 - Responsible practices
 - Efficiency through “smart” technologies
 - Alternative tenancies and flexibility of use

The following information has been compiled from a survey of 192 contemporary stadiums (at various levels of completion), and should begin to provide an indication of the pervading industry trends, at the moment. A more thorough account, of the results, may be found in the accompanying volume, *Stadiums: A Survey of Contemporary Sports Architecture Projects 2006 – 2012*.

Table 3.4 Project Survey Summary (by Year)

YEAR	PROJECTS	TOTAL COST	CAPACITY AVERAGE	PER CAPITA COST
2006	1	\$ 65,000,000	15500	\$ 4,193.55
2008	7	\$ 2,149,000,000	40204	\$ 6,513.53
2009	16	\$ 6,181,500,000	45964	\$ 7,160.21
2010	10	\$ 3,791,000,000	44372	\$ 7,654.56
2011	19	\$ 3,668,250,000	39114	\$ 4,597.35
2012	7	\$ 2,382,500,000	42834	\$ 7,280.28
2013	28	\$ 6,493,500,000	48820	\$ 4,784.67
2014	35	\$ 8,829,500,000	37314	\$ 5,396.81
2015	16	\$ 3,966,500,000	40234	\$ 5,664.98
2016	7	\$ 3,530,000,000	56286	\$ 8,882.30
2017	15	\$ 5,835,000,000	45629	\$ 10,771.68
2018	2	\$ 1,028,000,000	49000	\$ 10,149.12
2019	1	\$ 662,000,000	86250	\$ 7,675.36
2020	1	N/A	44740	N/A
2021	7	\$ 1,824,000,000	45279	\$ 5,763.55
TBA	12	\$ 6,126,000,000	41129	\$ 10,160.86
AVERAGE	11.5	\$ 3,769,000,000	47145	\$ 7,318.23

Table 3.5 Project Survey Summary (by Nation)

NATION	PROJECTS	TOTAL COST	CAPACITY	PER CAPITA COST
ALGERIA	1	\$ 135,000,000	60000	\$ 2,250.00
ARGENTINA	1	\$ 250,000,000	75000	\$ 3,333.33
AUSTRALIA	2	\$ 953,000,000	45250	\$ 9,980.87
AZERBAIJAN	1	\$ 640,000,000	68700	\$ 9,315.87
BELARUS	1	\$ 54,000,000	12896	\$ 4,187.34
BELGIUM	1	\$ 68,000,000	22500	\$ 3,022.22
BRAZIL	15	\$ 3,978,000,000	55933	\$ 4,671.17
BULGARIA	2	\$ 108,000,000	29000	\$ 3,600.00
CANADA	5	\$ 989,000,000	33664	\$ 6,585.24
CHINA	3	\$ 423,000,000	70500	\$ 4,648.35
CZECH REPUBLIC	1	\$ 47,500,000	21000	\$ 2,261.90
FINLAND	1	\$ 328,000,000	38000	\$ 8,631.58
FRANCE	9	\$ 3,251,500,000	48519	\$ 7,451.40
GERMANY	7	\$ 549,000,000	32969	\$ 2,327.40
GREECE	1	\$ 110,000,000	42000	\$ 2,619.05
HUNGARY	2	\$ 162,000,000	20010	\$ 4,048.53
INDONESIA	2	\$ 48,000,000	39000	\$ 1,263.16
IRAQ	3	\$ 520,000,000	48333	\$ 3,261.44
IRELAND	1	\$ 555,000,000	51700	\$ 10,735.01
ISRAEL	2	\$ 200,000,000	23410	\$ 3,995.98
ITALY	3	\$ 469,000,000	33713	\$ 4,712.45
JAPAN	1	\$ 150,000,000	32000	\$ 4,687.50
KUWAIT	1	\$ 220,000,000	64000	\$ 3,437.50
MEXICO	1	\$ 200,000,000	50000	\$ 4,000.00
MOROCCO	1	\$ 245,000,000	81000	\$ 3,024.69
NETHERLANDS	1	\$ 429,000,000	80000	\$ 5,362.50
POLAND	21	\$ 2,486,250,000	26103	\$ 3,588.25
QATAR	10	\$ 2,736,000,000	49306	\$ 5,951.22
RUSSIA	13	\$ 5,089,000,000	43699	\$ 11,892.64
SAUDI ARABIA	1	\$ 560,000,000	60000	\$ 9,333.33
SCOTLAND	1	\$ 80,000,000	22000	\$ 3,636.36
SERBIA	1	\$ 165,000,000	60000	\$ 2,750.00
SINGAPORE	1	\$ 1,500,000,000	55000	\$ 27,272.73
SLOVAKIA	1	\$ 95,000,000	20500	\$ 4,634.15
SOUTH AFRICA	6	\$ 1,900,000,000	60679	\$ 4,846.15
SOUTH KOREA	2	\$ 400,000,000	48578	\$ 6,666.67
SPAIN	3	\$ 1,017,000,000	67387	\$ 5,058.93
SWEDEN	2	\$ 690,500,000	47500	\$ 8,833.97
TAIWAN	1	\$ 150,000,000	55000	\$ 2,727.27
TURKEY	10	\$ 765,000,000	37829	\$ 2,144.53
UKRAINE	3	\$ 1,108,000,000	46526	\$ 8,066.50
UNITED ARAB EMIRATES	1	\$ 226,000,000	60000	\$ 3,766.67
UNITED KINGDOM	8	\$ 2,415,000,000	39288	\$ 7,090.13
UNITED STATES	30	\$ 20,067,000,000	40008	\$ 11,666.93

Table 3.6 Project Survey Summary (by US State)

STATE	PROJECTS	TOTAL COST	CAPACITY AVERAGE	PER CAPITA COST
CALIFORNIA	6	\$ 6,367,000,000	46750	\$ 24,246.19
WASHINGTON, DC	2	\$ 888,000,000	34983	\$ 11,600.68
FLORIDA	1	\$ 634,000,000	36742	\$ 17,255.46
GEORGIA	1	\$ 1,000,000,000	65000	\$ 15,384.62
INDIANA	1	\$ 750,000,000	63000	\$ 11,904.76
LOUISIANA	1	\$ 70,000,000	30000	\$ 2,333.33
MINNESOTA	2	\$ 1,520,000,000	56252	\$ 13,576.12
MISSOURI	1	\$ 200,000,000	25000	\$ 8,000.00
NORTH CAROLINA	1	\$ 54,000,000	10000	\$ 5,400.00
NEW JERSEY	2	\$ 1,800,000,000	53878	\$ 13,659.21
NEW YORK	4	\$ 4,300,000,000	48072	\$ 21,665.53
PENNSYLVANIA	1	\$ 120,000,000	18500	\$ 6,486.49
TEXAS	6	\$ 2,254,000,000	51718	\$ 6,382.57
UTAH	1	\$ 110,000,000	20213	\$ 5,442.04

Table 3.7 Project Survey Summary (by Cost)

COST	PROJECTS
BELOW \$25 MILLION	5
BELOW \$50 MILLION	16
BELOW \$75 MILLION	16
BELOW \$100 MILLION	10
BELOW \$150 MILLION	20
BELOW \$200 MILLION	16
BELOW \$250 MILLION	18
BELOW \$300 MILLION	19
BELOW \$400 MILLION	14
BELOW \$500 MILLION	11
BELOW \$600 MILLION	5
BELOW \$700 MILLION	10
BELOW \$800 MILLION	3
BELOW \$900 MILLION	1
BELOW \$1.00 BILLION	3
BELOW \$1.25 BILLION	3
BELOW \$1.50 BILLION	4
BELOW \$2.00 BILLION	1
BELOW \$2.50 BILLION	1
N/As	8

Table 3.8 Project Survey Summary (by Capacity)

CAPACITY	PROJECTS
BELOW 10,000	1
BELOW 20,000	19
BELOW 30,000	33
BELOW 40,000	30
BELOW 50,000	40
BELOW 60,000	24
BELOW 70,000	15
BELOW 80,000	13
BELOW 90,000	6
BELOW 100,000	2
ABOVE 100,000	1

Table 3.9 Project Survey Summary (by Purpose)

TENANT/USAGE	PROJECTS
OLYMPIC GAMES	5
FIFA WORLD CUP	42
OTHER INTERNATIONAL COMPETITION	23
COLLEGIATE FOOTBALL (AMERICAN)	4
MULTI-PURPOSE NATIONAL STADIUM	12
PROFESSIONAL BASEBALL	9
PROFESSIONAL BASKETBALL	1
PROFESSIONAL FOOTBALL (AMERICAN)	9
PROFESSIONAL FOOTBALL (AUSTRALIAN)	1
PROFESSIONAL FOOTBALL (CANADIAN)	4
PROFESSIONAL FOOTBALL (WORLD)	71
PROFESSIONAL RUGBY	3

This sample of projects demonstrates a wide variety of styles and potential resolutions to the aforementioned issues. What remains clear, however, is that, for all the rigor in their designs, most of these facilities rely on the more traditional models of construction and more outdated modes of thinking. With the markets increasing and the world evolving, the concept of the permanent stadium will soon need to adapt, or it is in serious danger of extinction.

THROUGH THE LENS OF GLOBAL ECONOMICS AND DEMOGRAPHICS

Constantly moving and immeasurably interconnected, the world is a dynamic and difficult subject to analyze, or better yet, comprehend. Statistics, concerning population demographics and global economics, offer a glimpse into such complexity, from which it is possible to make judgments and informed decisions. For the purposes of this paper, it is simply necessary to utilize this data to formulate an idea of how people, wealth, and resources are distributed, throughout the world. Then, we may begin to infer as to the potential suitability of pursuing such large scale stadium projects and mega-events (*see Appendix F*).



Figure 3.1 Global Population Demographics



Figure 3.2 Global Population below Poverty Line (%)



Figure 3.3 Global Gross Domestic Product Statistics (\$Billions)



Figure 3.4 Global Climate – Temperature (°F)



Figure 3.5 Global Infrastructure - Roadways (km)



Figure 3.6 Global Infrastructure – Airports



Figure 3.7 Global Demographics – Cellular Telephones



Figure 3.8 Global Demographics – Internet Users

A comparison of these diagrams with a map of projects, either recently completed or currently in-progress (*see Stadiums*), illustrates the incongruence between expectation and reality, throughout the world. While it is a wonderful thing to see that opportunities are being afforded to smaller markets and developing countries, their lack of adequate resources, infrastructure, or economic stability make the required expenditures incurred difficult to justify.

More than any other aspect of design, it is crucial to understand the needs of the local people, those who will be most affected by in end product. In terms of scope and scale of these future projects, we must be aware of the opportunities and limitations imposed therein, in order to avoid the threat of over burden. Thus, if these trends are to continue, our underlying notions about the design and planning processes must change, and as architects, we need to be able to take up the mantle. By accepting the need for innovation, it may be possible to dictate the future trajectory of the industry and ensure its ultimate success.

CHAPTER 4

DESIGN FOR DISASSEMBLY: A PRESCRIPTION

The following is a list of stakeholders aligned with various aspects of stadium design, construction, and operation (*KPMG*):

Architects	Athletes	Contractors/Sub-Contractors
Developers	Engineers	Facilities Managers and Operators
Financial Sponsors	Governing Body	Landscape Architects
Legal Advisors	Legislators	Local Community
Market and Financial Advisors	Marketers	Municipality
Project Managers	Public Officials	Public Relations Coordinators
Security and Safety Consultants	Sports Teams	Supporters/Fan Base
Technical Consultants	Tourists	Urban Planners

Throughout these processes, it is easy to lose sight of the greatest interests involved, those of the general public. As such, it is necessary to envision an alternative to, what has become, an outdated mode of thinking, in regards to sports architecture. We must understand that, while such issues as innovation and return on investment are important, the overall success or failure is measured by the connection to the local community and environment. We must breakdown the traditional design model and consider a reversal of the roles therein.



Figure 4.1 Opposing Relationships of (a) Object to Field and (b) Solid to Void

Where, before, the stadium was seen an isolated and unmoving solid, bounded only by sprawling parking lots, transient crowds, and temporary structures, the surrounding environment must become the more permanent component, with the stadium receding into an ancillary, ever-more malleable position.

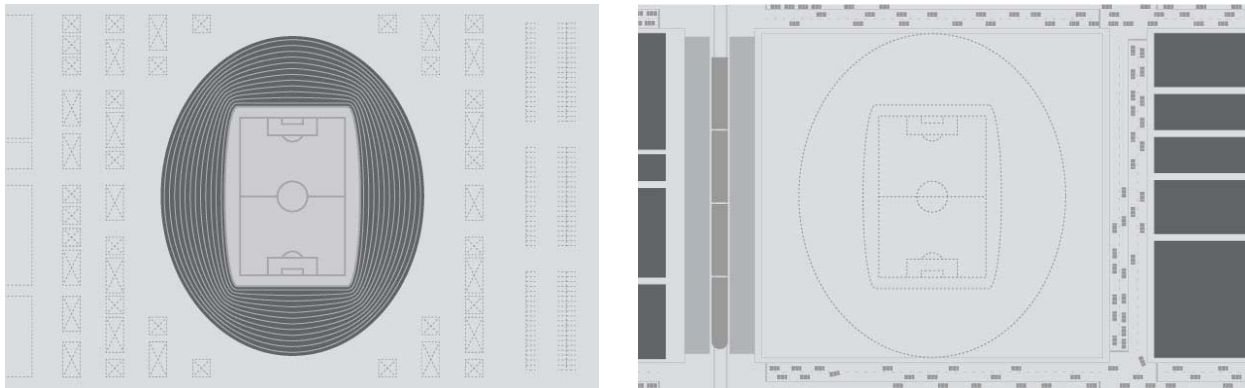


Figure 4.2 (a) Solid Stadium, Malleable Surroundings vs. (b) Solid Surroundings, Malleable Stadium

Architecturally, the opinion of disassembly is controversial and complex. In an industry centered around the erection of structure, it opposes almost all of architecture's basest prototypical notions and tenets. For the purposes of this thesis, however, the conceptual and physical disassembly of the modern stadium is meant as a prescription to the concerns facing the typology, at large. Each, in its own way, is meant to address the inequities associated with continued stadium operation.

Professional stadiums, with permanent franchise residents, are guaranteed occupation only a handful of times, at most, while the remainder of the year, they are confronted with the risk of standing idle and vacant. This has been a pressing issue, within the industry, for quite some time. Ever since the introduction of the corporate sponsorship, owners and operators have been interested in the management of the vast expenses incurred by running a stadium. In response to the recent calls for increased sustainability, designers have been presented with the challenge of boosting off-game and off-season attendance and facility usage. From museums and conference

centers to daycares and mausoleums, any number of alternative tenants have been proposed (*KPMG*). While ideal solution to this issue has yet to be found, the opportunity remains for such a massive building to evolve programmatically and it seems only logical that such a massive amount of space be put to better, more persistent use. It is imperative to address the stadium's rising costs, otherwise the stadium remains in danger of losing its position in the city, or worse yet, overextending its affordability within the urban environment and thus designing itself into extinction.

For the cases, in which the long-term maintenance of such a facility is not a viable option (such as international mega-events being held in smaller, less-established markets), the possibility of deconstruction must be considered. Through the work of such firms as Anderson Anderson Architecture and Kieran Timberlake, the concept of “designing for disassembly” has been tested at more modest scales, particularly within the residential and educational markets, and there is no reason to believe that the same principles may be applied to stadium design. Modularity and prefabrication would provide for a more consistent implementation process, without sacrificing much in terms of customizable assemblages, based on the needs of the individual event. Additionally, given the infrastructural requirements of a stadium, at that scale, these methods could help stimulate the construction of roads, power and water lines, and waste management facilities that would remain beyond the event and aiding in the ultimate redevelopment of the area.

With the help of some innovative planning and economic strategies, such as equipment leasing and event-to-event reuse, there is immense potential in revolutionizing the manner and timeliness in which these projects (and mega-events as a whole) are executed. According to the Swiss firm, Nussli, modular construction has shown the potential to cut construction costs in half, while John Barrow, Principal at Populous, believes it can reduce project timelines by one-third

(*Knight*). Not only would any long-term burden, associated with these projects, be eliminated, the expectation and perception of the entire industry would evolve, for the better.

CHAPTER 5

FUTURE LEGACY

Sports architecture is at a point in which the integration, with the greater public, must be addressed at the earliest steps of design, whether it be at the local, regional, or national levels. Gone are the days when stadiums can simply be flashy and expensive, without consequence or concern for long-term impact (*Hiller*). It is clear that recent trends have attempted to tackle issues of sustainability and environmental responsibility, and that progress continues to be made at every outset. For as valiant and progressive as these efforts are, however, for now, they remain limited, either by technology, economy, or time. Additionally, the simple application of these ideas to the traditional model of stadium design construction, which inherently restricts our ambition. In order to truly serve the, so-called, “greater good,” it is necessary to accept that the traditional stadium puts an immense burden on the environment and neighboring community, regardless of number of LEED certifications awarded, development opportunities promised, or cost-saving initiatives put in place. Particularly in the case of a short-term venture, like the Olympics or World Cup, the long-term impact on the land and the people will continue to incite much controversial deliberation. Without more public integration, more environmental consideration, and more permanent and regular tenancy, these issues will persist.

BY THE NUMBERS

Within sports architecture, the sustainable initiative is one that is beginning to take hold. In the United States, 38 of 126 teams (across the five major sports leagues) employ some form of sustainable technology or environmentally-conscious practice (*Mihoces*). Still, with more than 65,000 kWh of electricity and 35,000 ft² of natural gas being consumed by the typical professional stadium (*Kiani*), over the course of a single game, much more could be accomplished.

In the most extreme of cases, the brand-new, AT&T Stadium, in Dallas, TX consumes more than 2,000,000 kWh of electricity, at a cost of over \$200,000, per month (*Glubiak*).

This has been equated to the annual power requirements of a city the size of Santa Monica, CA, or a peak usage (10 MW) three-times that of the capabilities of the entire power grid, in the country of Liberia (*Lefebvre*).

Beyond these requirements, it is also revealing to examine those issues surrounding the impact sports architecture may have on carbon footprint.

Stadium construction and infrastructural development involved with the Summer Olympics, in Beijing, accounted for the generation of almost 1,500,000 tons of carbon dioxide, while the World Cup, in South Africa, produced in excess of 2,750,000 tons (*Popke*). This number equates to emissions from:

308295000	Gallons of Gasoline
114584000	Propane BBQ Tanks
6395000	Barrels of Oil
539000	Vehicles
234000	Homes for One Year
36000	Tanker Trucks
15000	Railcars of Coal

Given these staggering figures, it is clear that alternative models for the stadium and mega-event need to be considered.

VISION OF THINGS TO COME

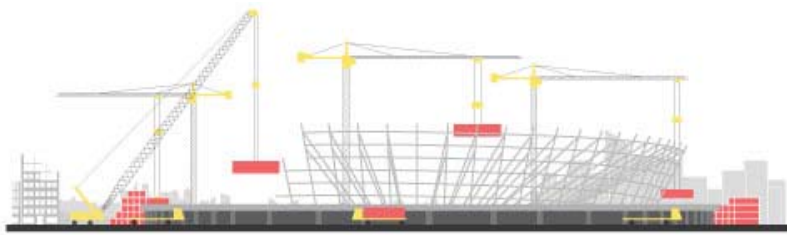
Legacy may be defined in a number of ways. In designing for disassembly, the legacy of the future may be one in which the stadium typology is completely reimagined, or it may be one which is wholly detached from the sports facility, itself. Either way, the associated complications of operation and maintenance (namely alternative tenancy and off-game use) are eliminated and all that remains is a vibrant and functionally sound infrastructure upon which to redevelop.

It has been said that the future of stadiums will require a considerable amount of flexibility (*Knight*). Despite its seemingly radical nature, whether through the reprogramming of the stadium or the physical reconfiguration of its parts, one cannot deny the potential attractiveness of such a proposition. Granted, there are a vast number of additional concerns which must be dealt with, but assuming proper planning and site selection, there is no reason why we cannot envision a future in which all stakeholders benefit and the temporary stadium becomes the generator of a lasting, positive urban legacy.

Below is a vision of the ideal scenario, in which the process, through a larger community developmental plan, the hosting a mega-event may truly provide for sustainable improvement, given the construction, and subsequent de-construction, of a major sports stadium.



*Figure 5.1 Idealized Legacy Procedure, including
(a) Original Brownfield Site Condition, Disconnected from Urban Core*



(b) Pre-Event Assembly and Construction



(c) Mega-Event in Action



(d) Post-Event Disassembly



(e) Post-Event Urban Development and Renewal, as extension of Urban Core

CHAPTER 6

CONCLUSIONS

Today, the ideas of expansive development and innovative technology are founded upon the opportunities which they may ultimately provide for the general public. The sports and architecture industries, being no different, promise countless benefits for local communities willing to build stadiums and host international competitions. Unfortunately, history has shown that a major gap exists between expectation and reality, and rarely is the public agenda wholly served by such an undertaking. For all of the time, space, and money that a stadium requires, too many components must align in order to yield a truly positive end product. More often than not, a stadium's legacy is defined by the negative impact it has on its environment and the people it was meant to serve.

Redevelopment does not occur over the course of only a single event, such as the Olympics and World Cup, or through the construction of a single building, regardless of scale. These efforts should be part of a larger initiative, one that continually focuses on the public, at large, and on the post-event scenario (*Zhang*). As architects, through the use of design, there is a reasonable resolution. Instead of attempting to redefine the stadium's place within the urban environment, we should be challenging the concept of the stadium, and the event, itself. Rod Sheard, Principal at Populous, once asked, "What is the legacy that a sporting event can leave behind?" (*Sheard*). Beyond all of the economics and emotions, sports and sporting events can leave a very real and physical imprint upon their surroundings. The future of stadium design lies in the ability to facilitate a positive impact on both the natural and social orders, and it is the responsibility of the

architect to make the necessary design decisions which will ensure its facilitation of and integration within the greater framework of the public agenda.

APPENDIX A

DETAILS OF THE SUMMER OLYMPIC GAMES

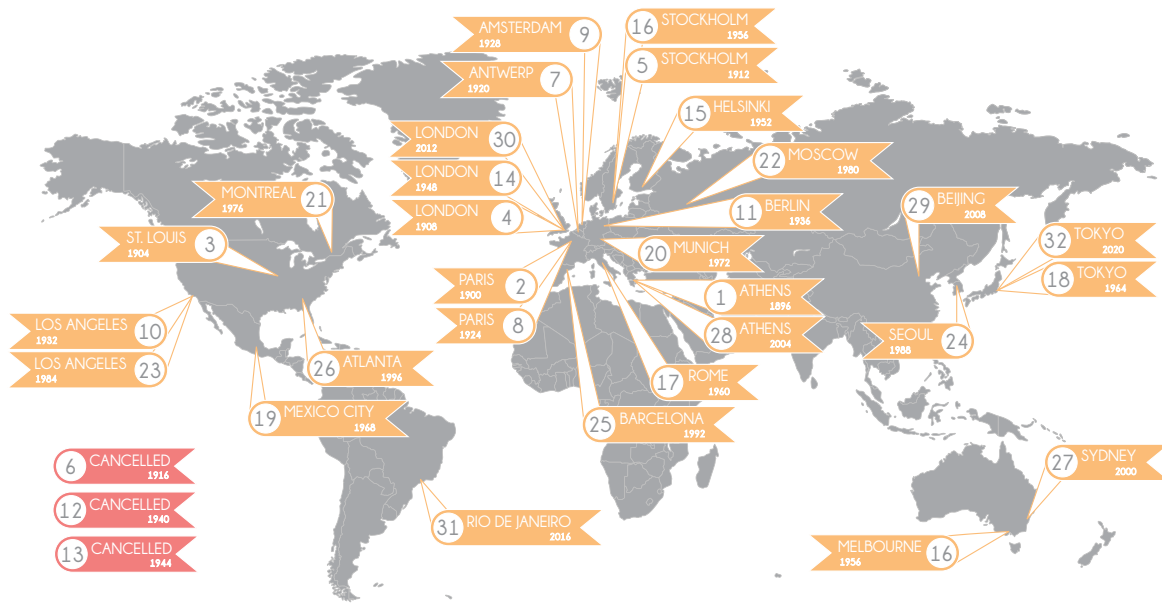


Figure A.1 Summer Olympic Hosts



Figure A.2 Summer Olympic Logos through History

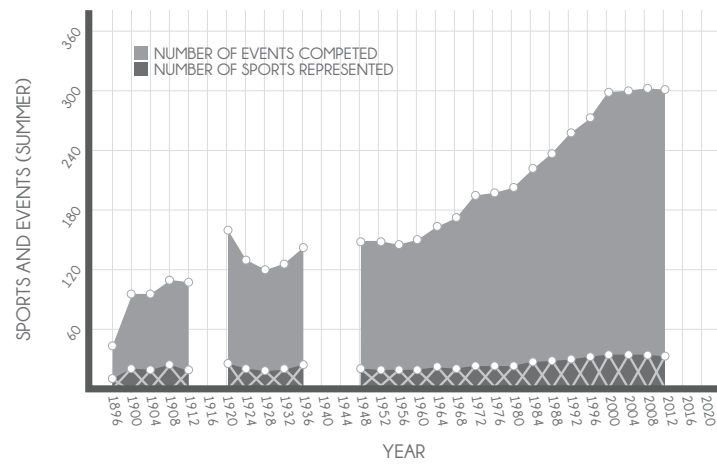


Figure A.3 Competition Breakdown - Summer Olympics

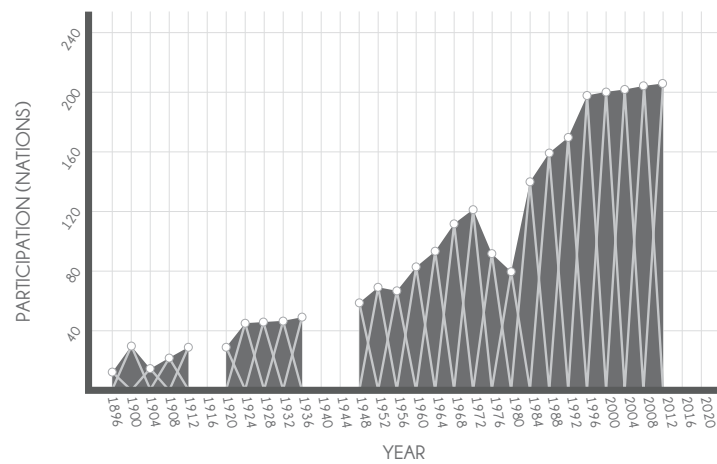


Figure A.4 Number of Countries in Attendance - Summer Olympics

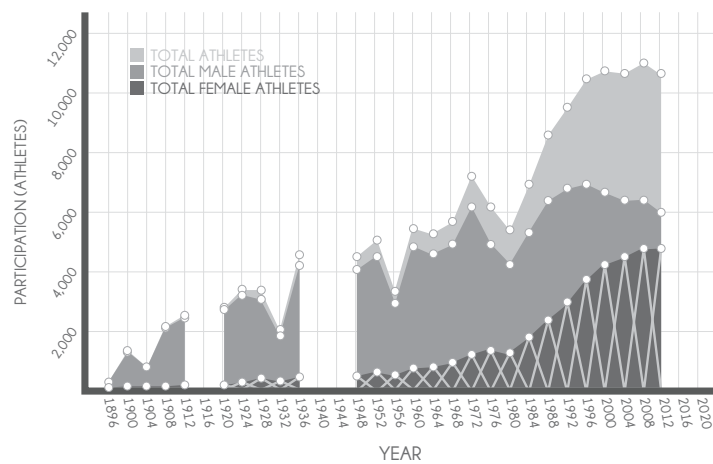


Figure A.5 Athlete Demographics - Summer Olympics

Table A.1 Summer Olympic Details

YEAR	OLYMPIAD	HOST CITY	OPENING CEREMONIES	CLOSING CEREMONIES
1896	I	ATHENS, GREECE	APRIL 6	APRIL 15
1900	II	PARIS, FRANCE	MAY 14	OCTOBER 28
1904	III	ST. LOUIS, UNITED STATES	JULY 1	NOVEMBER 23
1908	IV	LONDON, UNITED KINGDOM	APRIL 27	OCTOBER 31
1912	V	STOCKHOLM, SWEDEN	MAY 5	JULY 22
1916	VI	BERLIN, GERMANY	CANCELLED	
1920	VII	ANTWERP, BELGIUM	APRIL 20	SEPTEMBER 12
1924	VIII	PARIS, FRANCE	MAY 4	JULY 27
1928	IX	AMSTERDAM, NETHERLANDS	MAY 17	AUGUST 12
1932	X	LOS ANGELES, UNITED STATES	JULY 30	AUGUST 14
1936	XI	BERLIN, GERMANY	AUGUST 1	AUGUST 16
1940	XII	TOKYO, JAPAN → HELSINKI, FINLAND	CANCELLED	
1944	XIII	LONDON, UNITED KINGDOM	CANCELLED	
1948	XIV	LONDON, UNITED KINGDOM	JULY 29	AUGUST 14
1952	XV	HELSINKI, FINLAND	JULY 19	AUGUST 3
1956	XVI	MELBOURNE, AUSTRALIA + STOCKHOLM, SWEDEN	NOVEMBER 22 JUNE 10	DECEMBER 8 JUNE 17
1960	XVII	ROME, ITALY	AUGUST 25	SEPTEMBER 11
1964	XVIII	TOKYO, JAPAN	OCTOBER 10	OCTOBER 24
1968	XIX	MEXICO CITY, MEXICO	OCTOBER 12	OCTOBER 27
1972	XX	MUNICH, WEST GERMANY	AUGUST 26	SEPTEMBER 11
1976	XXI	MONTREAL, CANADA	JULY 17	AUGUST 1
1980	XXII	MOSCOW, SOVIET UNION	JULY 19	AUGUST 3
1984	XXIII	LOS ANGELES, UNITED STATES	JULY 28	AUGUST 12
1988	XXIV	SEOUL, SOUTH KOREA	SEPTEMBER 17	OCTOBER 2
1992	XXV	BARCELONA, SPAIN	JULY 25	AUGUST 9
1996	XXVI	ATLANTA, UNITED STATES	JULY 19	AUGUST 4
2000	XXVII	SYDNEY, AUSTRALIA	SEPTEMBER 15	OCTOBER 1
2004	XXVIII	ATHENS, GREECE	AUGUST 13	AUGUST 29
2008	XXIX	BEIJING, CHINA	AUGUST 8	AUGUST 24
2012	XXX	LONDON, UNITED KINGDOM	JULY 27	AUGUST 12
2016	XXXI	RIO DE JANEIRO, BRAZIL	AUGUST 5	AUGUST 21
2020	XXXII	TOKYO, JAPAN	JULY 24	AUGUST 9

Table A.2 Summer Olympic Athlete Demographics

YEAR	HOST CITY	COUNTRIES	PARTICIPANTS	MEN	WOMEN	SPORTS	EVENTS
1896	ATHENS, GREECE	12	176	176	0	9	43
1900	PARIS, FRANCE	30	1222	1199	23	20	95
1904	ST. LOUIS, UNITED STATES	15	651	645	6	18	95
1908	LONDON, UNITED KINGDOM	22	2024	1980	44	24	109
1912	STOCKHOLM, SWEDEN	29	2409	2356	53	17	107
1916	BERLIN, GERMANY	CANCELLED					
1920	ANTWERP, BELGIUM	29	2675	2597	78	25	160
1924	PARIS, FRANCE	45	3256	3104	152	20	130
1928	AMSTERDAM, NETHERLANDS	46	3247	2936	311	17	120
1932	LOS ANGELES, UNITED STATES	47	1922	1720	202	18	126
1936	BERLIN, GERMANY	49	4482	4121	361	24	143
1940	TOKYO, JAPAN → HELSINKI, FINLAND	CANCELLED					
1944	LONDON, UNITED KINGDOM	CANCELLED					
1948	LONDON, UNITED KINGDOM	59	4372	3932	440	20	149
1952	HELSINKI, FINLAND	69	4932	4411	521	19	149
1956	MELBOURNE, AUSTRALIA + STOCKHOLM, SWEDEN	67	3189	2818	371	18	145
1960	ROME, ITALY	83	5350	4738	612	19	150
1964	TOKYO, JAPAN	93	5137	4457	680	21	163
1968	MEXICO CITY, MEXICO	112	5557	4774	783	20	172
1972	MUNICH, WEST GERMANY	121	7113	6053	1060	23	195
1976	MONTREAL, CANADA	92	6073	4813	1260	23	198
1980	MOSCOW, SOVIET UNION	80	5259	4136	1123	23	203
1984	LOS ANGELES, UNITED STATES	140	6799	5229	1569	26	221
1988	SEOUL, SOUTH KOREA	159	8453	6251	2202	27	237
1992	BARCELONA, SPAIN	169	9386	6663	2723	29	257
1996	ATLANTA, UNITED STATES	197	10341	6820	3521	31	271
2000	SYDNEY, AUSTRALIA	200	10648	6579	4069	34	300
2004	ATHENS, GREECE	201	10561	6257	4304	34	301
2008	BEIJING, CHINA	204	10901	6290	4611	34	303
2012	LONDON, UNITED KINGDOM	205	10520	5864	4656	32	302
2016	RIO DE JANEIRO, BRAZIL	TBD					
2020	TOKYO, JAPAN	TBD					

Table A.3 Summer Olympic Architectural Details

YEAR	HOST CITY	MAIN STADIUM	ARCHITECT	CURRENT USE
1896	ATHENS	PANATHENAIC STADIUM	ANASTASIOS METAXES	2004 OLYMPICS AND OTHER NATIONAL EVENTS
1900	PARIS	VELODROME DE VINCENNES	N/A	CYCLING, FOOTBALL, AND RUGBY EVENTS
1904	ST. LOUIS	FRANCIS FIELD	COPE AND STEWARDSON	WASHINGTON UNIVERSITY OF ST. LOUIS (NCAAF)
1908	LONDON	WHITE CITY STADIUM	JAMES FULTON	DEMOLISHED IN 1985
1912	STOCKHOLM	STOCKHOLMS OLYMPIASTADION	TORBEN GRUT	DJURGARDENS IF (SWEDISH ALLSVENSKAN)
1916	BERLIN	N/A	N/A	N/A
1920	ANTWERP	OLYMPISCH STADION	ARCHIBALD LEITCH	KFC GERMINAL BEERSCHOT (BELGIAN PRO FOOTBALL LEAGUE)
1924	PARIS	STADE OLYMPIQUE YVES-DU-MANOIR	LOUIS FAURE-DUJARRIC	RACING METRO 92 (TOP 14 RUGBY)
1928	AMSTERDAM	OLYMPISCH STADION	JAN WILS	TO BE RENOVATED FOR 2016 EUROPEAN ATHLETIC UNIVERSITY OF SOUTHERN CALIFORNIA (NCAAF)
1932	LOS ANGELES	LOS ANGELES MEMORIAL COLISEUM	JOHN AND DONALD PARKINSON	HERTHA BERLIN (GERMAN BUNDESLIGA)
1936	BERLIN	OLIMPIASTADION	WERNER MARCH AND ALBERT SPEER	
1940	TOKYO HELSINKI	N/A	N/A	N/A
1944	LONDON	N/A	N/A	N/A
1948	LONDON	EMPIRE STADIUM	SIR JOHN WILLIAM SIMPSON AND MAXWELL AYRTON	DEMOLISHED IN 2003
1952	HELSINKI	HELSINGIN OLYMPIASTADION	YRJO LINDEGREN AND TOIVO JANTTI	RENOVATED FOR 2012 EUROPEAN ATHLETIC CHAMPIONSHIPS
1956	MELBOURNE STOCKHOLM	MELBOURNE CRICKET GROUND	VARIOUS	MELBOURNE CRICKET CLUB
1960	ROME	STADIO OLIMPICO	ANNIBALE VITELLOZZI	ROMA AS (ITALIAN SERIE A)
1964	TOKYO	KOKURITSU KYOGIJO	MITSUO KATAYAMA	2019 RUGBY WORLD CUP AND 2020 OLYMPICS
1968	MEXICO CITY	ESTADIO OLIMPICO UNIVERSITARIO	AUGUSTO PEREZ PALACIOS, JORGE BRAVO, AND RAUL SALINAS	CLUB UNIVERSIDAD NACIONAL (MEXICAN LIGA MX)
1972	MUNICH	OLYMPIASTADION MUNCHEN	FREI OTTO, GUNTHER BEHNISCH, HERMANN PELTZ, AND CARLO WEBER	ANNUAL AIR AND STYLE SNOWBOARD EVENTS
1976	MONTREAL	OLYMPIC STADIUM	ROGER TAILLIBERT	UNOCCUPIED
1980	MOSCOW	CENTRAL LENIN STADIUM	WLASSOV, POLIKARPOV, AND RESNIKOV	TO BE RENOVATED FOR 2018 WORLD CUP
1984	LOS ANGELES	LOS ANGELES MEMORIAL COLISEUM	JOHN AND DONALD PARKINSON	UNIVERSITY OF SOUTHERN CALIFORNIA (NCAAF)
1988	SEOUL	JAMSIL OLYMPIC STADIUM	KIM SWOO GEUN	UNOCCUPIED
1992	BARCELONA	ESTADI OLIMPIC LLUIS COMPANYS	PERE DOMENECH I ROURA	CATALAN DRAGONS (SUPER LEAGUE RUGBY)
1996	ATLANTA	CENTENNIAL OLYMPIC STADIUM	HEERY INTERNATIONAL, ROSSER INTERNATIONAL, WILLIAMS-RUSSELL AND POPULOUS AND BLIGH LOBB SPORTS ARCHITECTURE	ATLANTA BRAVES (MLB), TO BE DEMOLISHED IN 2017
2000	SYDNEY	STADIUM AUSTRALIA		GWS GIANTS (AFL) AND SYDNEY THUNDER (BIG BASH CRICKET)
2004	ATHENS	OLYMPIC STADIUM	SANTIAGO CALATRAVA (RENOVATION)	AEK ATHENS (GREEK FOOTBALL LEAGUE 2)
2008	BEIJING	BEIJING NATIONAL STADIUM	HERZOG & DE MEURON, ARUP SPORT, CHINA ARCHITECTURAL DESIGN & RESEARCH	2015 WORLD ATHLETIC CHAMPIONSHIPS
2012	LONDON	THE STADIUM AT QUEEN ELIZABETH OLYMPIC PARK	POPULOUS	WEST HAM UNITED FC (BRITISH PREMIER LEAGUE)
2016	RIO DE JANEIRO	ESTADIO DO MARACANA	WALDIR RAMOS, RAPHAEL GALVAO, MIGUEL FELDMAN, OSCAR VALDETARO, ET AL	FLAMENGO AND FLUMINESE (CAMPEONATO BRASILEIRO SERIE A)
2020	TOKYO	TBD		

Table A.4 Summer Olympic Bid Details

COUNTRY	CITY	BIDS	HOST
ARGENTINA	BUENOS AIRES	1936, 1956, 1968, 2004	
AUSTRALIA	BRISBANE	1992	
AUSTRALIA	MELBOURNE	1956, 1996	1956
AUSTRALIA	SYDNEY	2000	2000
AUSTRIA	VIENNA	1964	
AZERBAIJAN	BAKU	2016, 2020	
BELGIUM	ANTWERP	1920	1920
BELGIUM	BRUSSELS	1916, 1960, 1964	
BRAZIL	BRAŚÍLIA	2000	
BRAZIL	RIO DE JANEIRO	1936, 2004, 2012, 2016	2016
CANADA	MONTREAL	1944, 1972, 1976	1976
CANADA	TORONTO	1996, 2008	
CHINA	BEIJING	2000, 2008	2008
CUBA	HAVANA	1920, 2008, 2012	
CZECH REPUBLIC	PRAGUE	1924, 2016	
EGYPT	ALEXANDRIA	1916, 1936	
EGYPT	CAIRO	2008	
FINLAND	HELSINKI	1936, 1940, 1944, 1952	1940, 1952
FRANCE	LILLE	2004	
FRANCE	LYON	1920, 1968	
FRANCE	PARIS	1900, 1924, 1992, 2008, 2012	1900, 1924
GERMANY	BERLIN	1908, 1916, 1936, 2000	1916, 1936
GERMANY	COLOGNE	1936	
GERMANY	FRANKFURT	1936	
GERMANY	LEIPZIG	2012	
GERMANY	MUNICH	1972	1972
GERMANY	NUREMBERG	1936	
GREECE	ATHENS	1896, 1944, 1996, 2004	1896, 2004
HUNGARY	BUDAPEST	1916, 1920, 1936, 1944, 1960	
IRELAND	DUBLIN	1936	
ITALY	MILAN	1908, 2000	
ITALY	ROME	1908, 1924, 1936, 1944, 1960, 2004, 2020	1960
JAPAN	NAGOYA	1988	

Table A.4 Summer Olympic Bid Details (continued)

COUNTRY	CITY	BIDS	HOST
JAPAN	OSAKA	2008	1940, 1964, 2020
JAPAN	TOKYO	1940, 1960, 1964, 2016, 2020	
MALAYSIA	KUALA LUMPUR	2008	
MEXICO	MEXICO CITY	1956, 1960, 1968	1968
NETHERLANDS	AMSTERDAM	1916, 1920, 1924, 1928, 1952, 1992	1928
PUERTO RICO	SAN JUAN	2004	1980
QATAR	DOHA	2016, 2020	
RUSSIA	MOSCOW	1976, 1980, 2012	
RUSSIA	SAINT PETERSBURG	2004	1988
SERBIA	BELGRADE	1992, 1996	
SOUTH AFRICA	CAPE TOWN	2004	
SOUTH KOREA	SEOUL	1988	1992
SPAIN	BARCELONA	1924, 1936, 1992	1912, 1956
SPAIN	MADRID	1972, 2012, 2016, 2020	
SPAIN	SEVILLE	2004, 2008	
SWEDEN	STOCKHOLM	1912, 1956, 2004	1908, 1944, 1948, 2012
SWITZERLAND	LAUSANNE	1936, 1944, 1948, 1960	
THAILAND	BANGKOK	2008	
TURKEY	ISTANBUL	2000, 2004, 2008, 2012, 2020	1996
UNITED KINGDOM	BIRMINGHAM	1992	
UNITED KINGDOM	LONDON	1908, 1944, 1948, 2012	
UNITED KINGDOM	MANCHESTER	1996, 2000	1932, 1984
UNITED STATES	ATLANTA	1920, 1996	
UNITED STATES	BALTIMORE	1948	
UNITED STATES	CHICAGO	1904, 1952, 1956, 2016	1904
UNITED STATES	CLEVELAND	1916, 1920	
UNITED STATES	DETROIT	1944, 1952, 1956, 1960, 1964, 1968, 1972	
UNITED STATES	LOS ANGELES	1924, 1928, 1932, 1948, 1952, 1956, 1976, 1980, 1984	2000
UNITED STATES	MINNEAPOLIS	1948, 1952, 1956	
UNITED STATES	NEW YORK	2012	
UNITED STATES	PHILADELPHIA	1920, 1948, 1952, 1956	1904
UNITED STATES	SAN FRANCISCO	1956	
UNITED STATES	ST. LOUIS	1904	
UZBEKISTAN	TASHKENT	2000	

APPENDIX B

DETAILS OF THE WINTER OLYMPIC GAMES

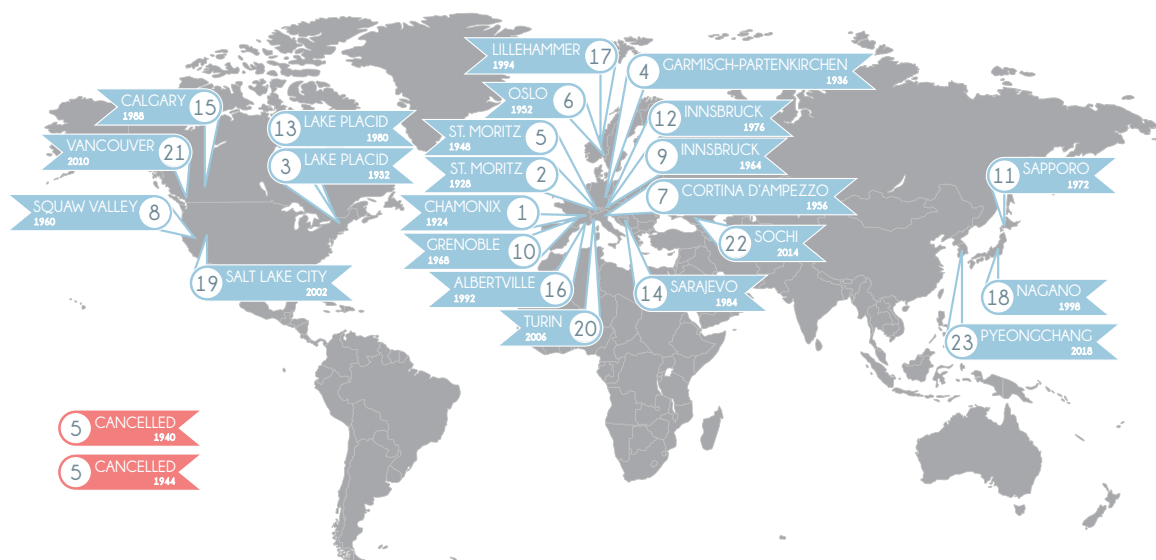


Figure B.1 Winter Olympic Hosts



Figure B.2 Winter Olympic Logos through History

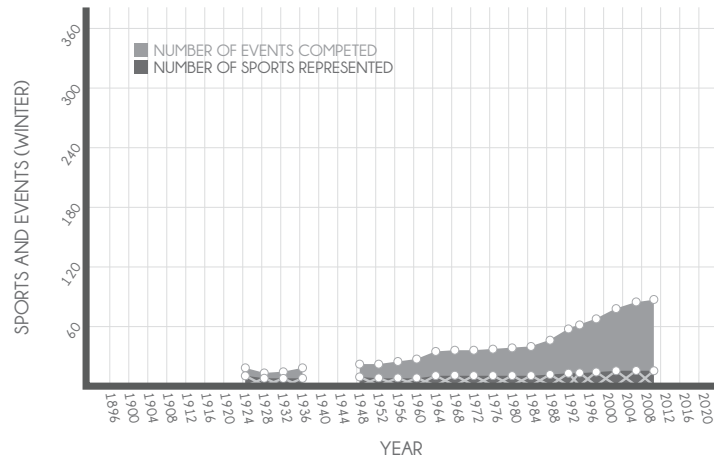


Figure B.3 Competition Breakdown - Winter Olympics

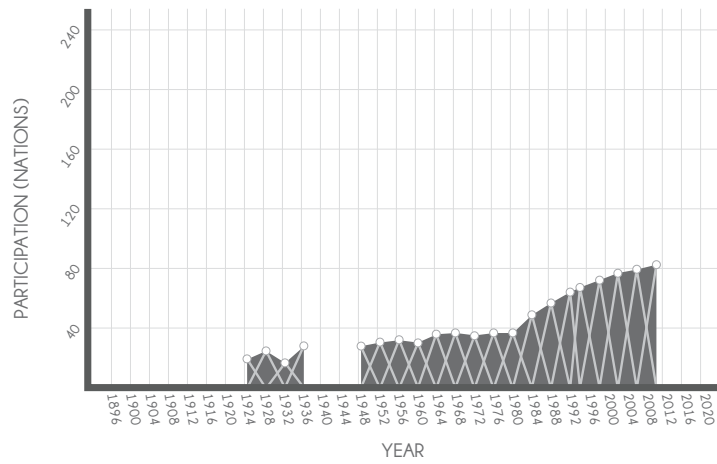


Figure B.4 Number of Countries in Attendance - Winter Olympics

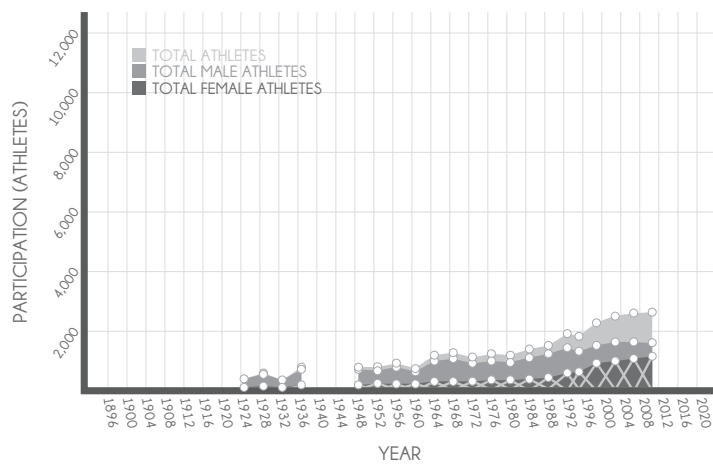


Figure B.5 Athlete Demographics - Winter Olympics

Table B.1 Winter Olympic Details

YEAR	OLYMPIAD	HOST CITY	OPENING CEREMONIES	CLOSING CEREMONIES
1924	I	CHAMONIX, FRANCE	JANUARY 25	FEBRUARY 4
1928	II	ST. MORITZ, SWITZERLAND	FEBRUARY 11	FEBRUARY 19
1932	III	LAKE PLACID, UNITED STATES	FEBRUARY 4	FEBRUARY 15
1936	IV	GARMISCH-PARTENKIRCHEN, GERMANY	FEBRUARY 6	FEBRUARY 16
1940	V	SAPPORO, JAPAN → ST. MORITZ, SWITZERLAND → GARMISCH-PARTENKIRCHEN, GERMANY	CANCELLED	
1944	V	CORTINA D'AMPEZZO, ITALY	CANCELLED	
1948	V	ST. MORITZ, SWITZERLAND	JANUARY 30	FEBRUARY 8
1952	VI	OSLO, NORWAY	FEBRUARY 14	FEBRUARY 25
1956	VII	CORTINA D'AMPEZZO, ITALY	JANUARY 26	FEBRUARY 5
1960	VIII	SQUAW VALLEY, UNITED STATES	FEBRUARY 18	FEBRUARY 28
1964	IX	INNSBRUCK, AUSTRIA	JANUARY 29	FEBRUARY 9
1968	X	GRENOBLE, FRANCE	FEBRUARY 6	FEBRUARY 18
1972	XI	SAPPORO, JAPAN	FEBRUARY 3	FEBRUARY 13
1976	XII	DENVER, UNITED STATES → INNSBRUCK, AUSTRIA	FEBRUARY 4	FEBRUARY 15
1980	XIII	LAKE PLACID, UNITED STATES	FEBRUARY 12	FEBRUARY 24
1984	XIV	SARAJEVO, YUGOSLAVIA	FEBRUARY 7	FEBRUARY 19
1988	XV	CALGARY, CANADA	FEBRUARY 13	FEBRUARY 28
1992	XVI	ALBERTVILLE, FRANCE	FEBRUARY 8	FEBRUARY 23
1994	XVII	LILLEHAMMER, NORWAY	FEBRUARY 12	FEBRUARY 27
1998	XVIII	NAGANO, JAPAN	FEBRUARY 7	FEBRUARY 22
2002	XIX	SALT LAKE CITY, UNITED STATES	FEBRUARY 8	FEBRUARY 24
2006	XX	TURIN, ITALY	FEBRUARY 10	FEBRUARY 26
2010	XXI	VANCOUVER, CANADA	FEBRUARY 12	FEBRUARY 28
2014	XXII	SOCHI, RUSSIA	FEBRUARY 7	FEBRUARY 23
2018	XXIII	PYEONGCHANG, SOUTH KOREA	FEBRUARY 9	FEBRUARY 25

Table B.2 Winter Olympic Athlete Demographics

YEAR	HOST CITY	COUNTRIES	PARTICIPANTS	MEN	WOMEN	SPORTS	EVENTS
1924	CHAMONIX, FRANCE	19	313	300	13	10	17
1928	ST. MORITZ, SWITZERLAND	25	463	435	28	8	13
1932	LAKE PLACID, UNITED STATES	17	253	231	21	8	14
1936	GARMISCH-PARTENKIRCHEN, GERMANY	28	668	588	80	8	17
1940	SAPPORO, JAPAN → ST. MORITZ, SWITZERLAND → GARMISCH-PARTENKIRCHEN, GERMANY	CANCELLED					
1944	CORTINA D'AMPEZZO, ITALY	CANCELLED					
1948	ST. MORITZ, SWITZERLAND	28	668	591	77	9	22
1952	OSLO, NORWAY	30	694	585	109	8	22
1956	CORTINA D'AMPEZZO, ITALY	32	821	689	132	8	24
1960	SQUAW VALLEY, UNITED STATES	30	665	521	144	8	27
1964	INNSBRUCK, AUSTRIA	36	1094	894	200	10	34
1968	GRENOBLE, FRANCE	37	1160	949	211	10	35
1972	SAPPORO, JAPAN	35	1008	802	206	10	35
1976	DENVER, UNITED STATES → INNSBRUCK, AUSTRIA	37	1129	898	231	10	37
1980	LAKE PLACID, UNITED STATES	37	1072	837	235	10	38
1984	SARAJEVO, YUGOSLAVIA	49	1273	996	277	10	39
1988	CALGARY, CANADA	57	1427	1111	315	11	46
1992	ALBERTVILLE, FRANCE	64	1801	1313	488	12	57
1994	LILLEHAMMER, NORWAY	67	1738	1216	522	12	61
1998	NAGANO, JAPAN	72	2180	1391	789	14	68
2002	SALT LAKE CITY, UNITED STATES	77	2399	1513	886	15	78
2006	TURIN, ITALY	79	2494	1539	955	15	84
2010	VANCOUVER, CANADA	82	2536	1503	1033	15	86
2014	SOCHI, RUSSIA	88	2873	N/A	N/A	15	98
2018	PYEONGCHANG, SOUTH KOREA	TBD					

Table B.3 Winter Olympic Architectural Details

YEAR	HOST CITY	MAIN STADIUM	ARCHITECT	CURRENT USE
1924	CHAMONIX	STADE OLYMPIQUE DE CHAMONIX	N/A	SKATING, SKIING, AND ICE HOCKEY EVENTS
1928	ST. MORITZ	ST. MORITZ OLYMPIC ICE RINK	N/A	SKATING AND ICE HOCKEY EVENTS
1932	LAKE PLACID	LAKE PLACID SPEEDSKATING OVAL	N/A	1989 ALLROUND WORLD CHAMPIONSHIPS
1936	GARMISCH-PARTENKIRCHEN	GROBE OLYMPIASCHANZE	N/A	RENOVATED FOR 2011 WORLD CHAMPIONSHIPS
1940	SAPPORO → ST. MORITZ GARMISCH-PARTENKIRCHEN	N/A	N/A	N/A
1944	CORTINA D'AMPEZZO	N/A	N/A	N/A
1948	ST. MORITZ	ST. MORITZ OLYMPIC ICE RINK	N/A	SKATING AND ICE HOCKEY EVENTS
1952	OSLO	BISLETT STADION	C. F. MØLLER ARCHITECTS	SKEID FOTBALL (NORWEGIAN THIRD DIVISION FOOTBALL)
1956	CORTINA D'AMPEZZO	STADIO OLIMPICO DEL GHIACCIO	N/A	SKATING ICE HOCKEY EVENTS
1960	SQUAW VALLEY	BLYTH ARENA	RUSSELL FRANCIS STECHSCHULTE	DEMOLISHED IN 1983
1964	INNSBRUCK	BERGISELSCHANZE	N/A	REDESIGNED IN 2002 BY ZAHA HADID
1968	GRENOBLE	STADE OLYMPIQUE DE GRENOBLE	N/A	DISASSEMBLED IN 1968
1972	SAPPORO	MAKOMANAI OPEN STADIUM	N/A	SKATING AND SNOWBOARDING EVENTS
1976	DENVER → INNSBRUCK	BERGISELSCHANZE	N/A	REDESIGNED IN 2002 BY ZAHA HADID
1980	LAKE PLACID	LAKE PLACID EQUESTRIAN STADIUM	N/A	EQUESTRIAN EVENTS
1984	SARAJEVO	OLIMPIJSKI STADION KOSEVO	N/A	FK SARAJEVO (PREMIER LEAGUE OF BOSNIA)
1988	CALGARY	MCMAHON STADIUM	RULE WYNN AND RULE	CALGARY STAMPEDERS (CFL)
1992	ALBERTVILLE	THEATRE DES CEREMONIES	JACQUES KALISZ	DISASSEMBLED IN 1992
1994	LILLEHAMMER	LYSGÅRDSBAKKENE SKI JUMPING ARENA	ØKAW ARKITEKTER	REBUILT IN 2007 FOR SKI JUMPING AND NORDIC WORLD CUPS
1998	NAGANO	NAGANO OLYMPIC STADIUM	N/A	SHINANO GRANDSEROWS (JAPANESE BASEBALL)
2002	SALT LAKE CITY	RICE-ECCLES STADIUM	FFKR ARCHITECTS	UNIVERSITY OF UTAH (NCAAF)
2006	TURIN	STADIO OLIMPICO DI TORINO	JOHN WORK ARTECO (RENOVATION)	TORINO FC (ITALIAN SERIE A)
2010	VANCOUVER	BC PLACE	STUDIO PHILLIPS BARRATT AND STANTEC ARCHITECTURE LTD.	BC LIONS (CFL) AND VANCOUVER WHITECAPS FC (MLS)
2014	SOCHI	FISHT OLYMPIC STADIUM	POPULOUS	TO BE RENOVATED FOR 2018 WORLD CUP
2018	PYEONGCHANG	OLYMPIC PARK OF HOENGGYE	TBD	TBD

Table B.4 Winter Olympic Bid Details

COUNTRY	CITY	BIDS	HOST
ANDORRA	ANDORRA LA VELLA	2010	
AUSTRIA	GRAZ	2002	
AUSTRIA	INNSBRUCK	1960, 1964, 1976	1964, 1976
AUSTRIA	KLAGENFURT	2006	
AUSTRIA	SALZBURG	2010, 2014	
BOSNIA AND HERZEGOVINA	SARAJEVO	1984, 2010	1984
BULGARIA	SOFIA	1992, 1994, 2014	
CANADA	CALGARY	1964, 1968, 1972, 1988	1988
CANADA	MONTREAL	1932, 1936, 1944, 1956	
CANADA	QUEBEC CITY	2002	
CANADA	VANCOUVER	1976, 1980, 2010	2010
CHINA	BEIJING	2022	
CHINA	HARBIN	2010	
FINLAND	HELSINKI	2006	
FINLAND	LAHTI	1964, 1968, 1972	
FINLAND	TAMPERE	1976	
FRANCE	ALBERTVILLE	1992	1992
FRANCE	ANNECY	2018	
FRANCE	CHAMONIX	1924	1924
FRANCE	GRENOBLE	1968	1968
GEORGIA	BORJOMI	2014	
GERMANY	BERCHTESGADEN	1992	
GERMANY	GARMISCH-PARTENKIRCHEN	1936, 1940, 1960	1936, 1940
GERMANY	MUNICH	2018	
ITALY	AOSTA	1998	
ITALY	CORTINA D'AMPEZZO	1944, 1952, 1956, 1988, 1992	1944, 1956
ITALY	TARVISIO	2002	
ITALY	TURIN	2006	2006
JAPAN	NAGANO	1998	1998
JAPAN	SAPPORO	1940, 1968, 1972, 1984	1940, 1972
KAZAKHSTAN	ALMATY	2014, 2022	
NORWAY	LILLEHAMMER	1992, 1994	1994
NORWAY	OSLO	1932, 1944, 1952, 1968, 2022	1952
POLAND	KRAKÓW	2022	
POLAND	ZAKOPANE	2006	

Table B.4 Winter Olympic Bid Details (continued)

COUNTRY	CITY	BIDS	HOST
RUSSIA	SOCHI	2002, 2014	2014
SLOVAKIA	POPRAD	2002, 2006	
SOUTH KOREA	PYEONGCHANG	2010, 2014, 2018	2018
SPAIN	JACA	1998, 2002, 2010, 2014	
SWEDEN	FALUN	1988, 1992	
SWEDEN	GOTHENBURG	1984	
SWEDEN	ÖSTERSUND	1994, 1998, 2002	
SWEDEN	STOCKHOLM	2022	
SWITZERLAND	BERN	2010	
SWITZERLAND	DAVOS	1928	
SWITZERLAND	ENGELBERG	1928	
SWITZERLAND	SION	1976, 2002, 2006	
SWITZERLAND	ST. MORITZ	1928, 1936, 1940, 1948, 1960	1928, 1940, 1948
UKRAINE	LVIV	2022	
UNITED STATES	ANCHORAGE	1992, 1994	
UNITED STATES	BEAR MOUNTAIN	1932	
UNITED STATES	COLORADO SPRINGS	1956	
UNITED STATES	DENVER	1932, 1976	1976
UNITED STATES	DULUTH	1932	
UNITED STATES	LAKE PLACID	1932, 1948, 1952, 1956, 1968, 1980	1932, 1980
UNITED STATES	MINNEAPOLIS	1932	
UNITED STATES	SALT LAKE CITY	1972, 1998, 2002	2002
UNITED STATES	SQUAW VALLEY	1960	1960
UNITED STATES	YOSEMITE VALLEY	1932	

APPENDIX C

DETAILS OF THE FIFA WORLD CUP

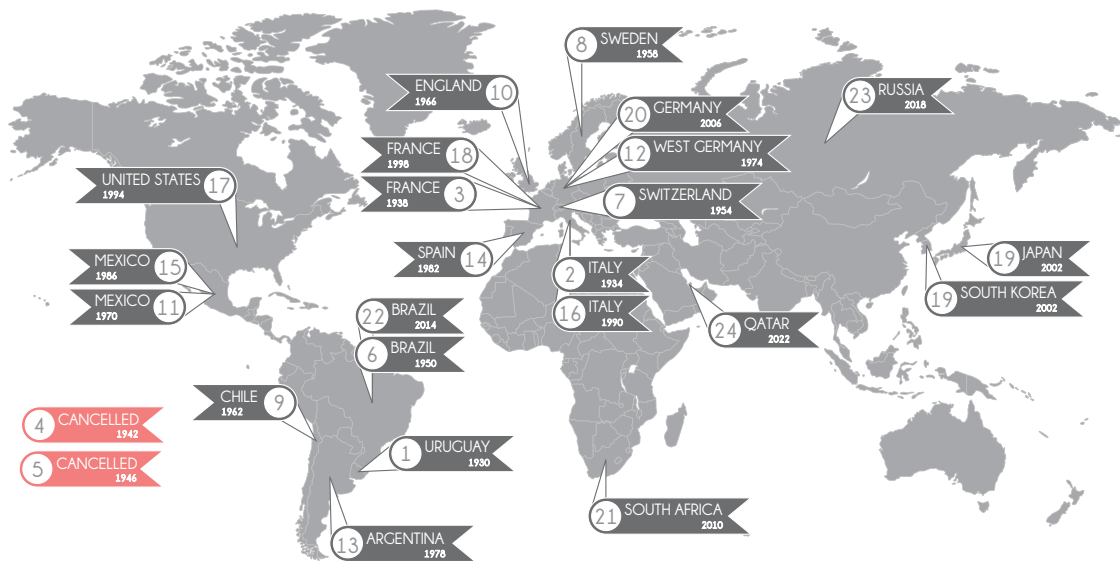


Figure C.1 World Cup Hosts



Figure C.2 World Cup Logos through History

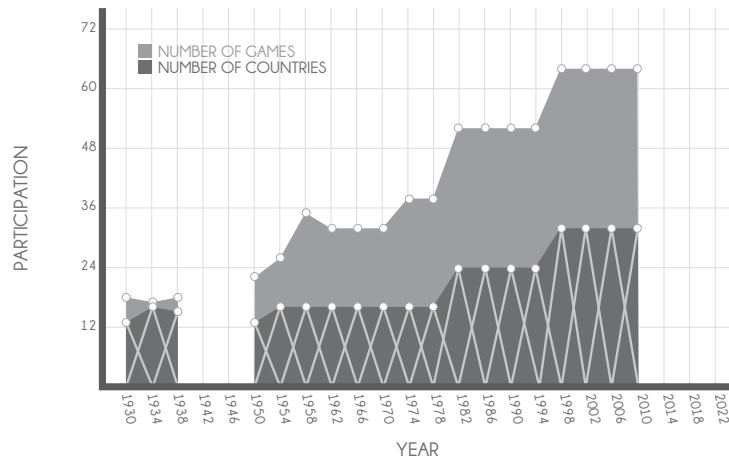


Figure C.3 Tournament Breakdown Statistics

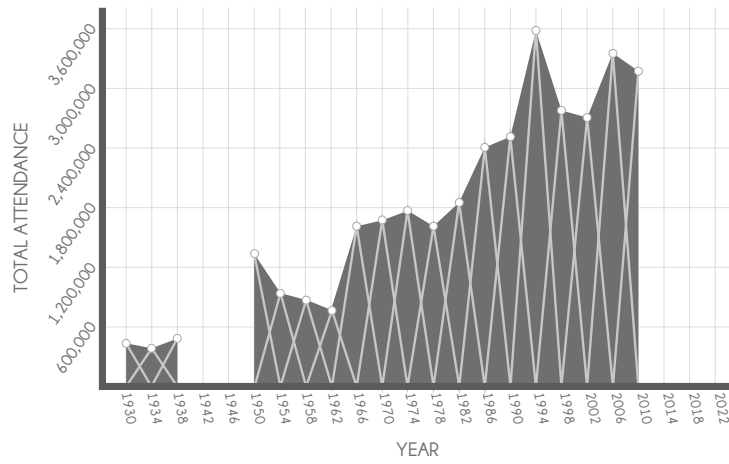


Figure C.4 Total Tournament Tickets Sold

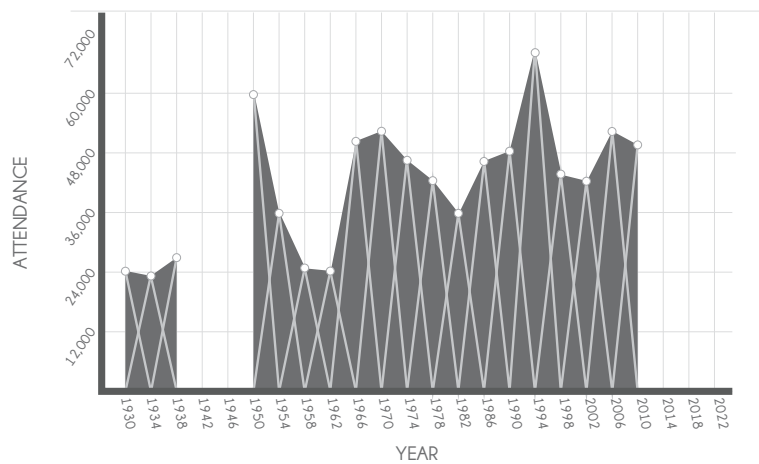


Figure C.5 Average Tickets Sold Per Game

Table C.1 World Cup Details

YEAR	TOURNAMENT	HOST	OPENING	CLOSING
1930	I	URUGUAY	JULY 13	JULY 30
1934	II	ITALY	MAY 27	JUNE 10
1938	III	FRANCE	JUNE 4	JUNE 19
1942	VI	CANCELLED		
1946	VII	CANCELLED		
1950	VIII	BRAZIL	JUNE 24	JULY 16
1954	IX	SWITZERLAND	JUNE 16	JULY 4
1958	X	SWEDEN	JUNE 8	JUNE 29
1962	XI	CHILE	MAY 30	JUNE 17
1966	XII	ENGLAND	JULY 11	JULY 30
1970	XIII	MEXICO	MAY 31	JUNE 21
1974	XIV	WEST GERMANY	JUNE 13	JULY 7
1978	XV	ARGENTINA	JUNE 1	JUNE 25
1982	XVI	SPAIN	JUNE 13	JULY 11
1986	XVII	MEXICO	MAY 31	JUNE 29
1990	XVIII	ITALY	JUNE 8	JULY 8
1994	XIX	UNITED STATES	JUNE 17	JULY 17
1998	XX	FRANCE	JUNE 10	JULY 12
2002	XXI	SOUTH KOREA & JAPAN	MAY 31	JUNE 30
2006	XXII	GERMANY	JUNE 9	JULY 9
2010	XXIII	SOUTH AFRICA	JUNE 11	JULY 11
2014	XXIV	BRAZIL	JUNE 12	JULY 13
2018	XXV	RUSSIA	JUNE 8	JULY 8
2022	XXVI	QATAR	TBD	TBD

Table C.2 World Cup Game and Attendance Details

YEAR	TOURNAMENT	NUMBER OF TEAMS	NUMBER OF GAMES	ATTENDANCE TOTAL	ATTENDANCE AVERAGE
1930	I	13	18	434,500	24,139
1934	II	16	17	395,000	23,235
1938	III	16/15	18	483,000	26,833
1942	VI	CANCELLED			
1946	VII	CANCELLED			
1950	VIII	16/13	22	1,337,000	60,773
1954	IX	16	26	943,000	36,269
1958	X	16	35	868,000	24,800
1962	XI	16	32	776,000	24,250
1966	XII	16	32	1,614,677	50,459
1970	XIII	16	32	1,673,975	52,312
1974	XIV	16	38	1,774,022	46,685
1978	XV	16	38	1,610,215	42,374
1982	XVI	24	52	1,856,277	35,698
1986	XVII	24	52	2,407,431	46,297
1990	XVIII	24	52	2,517,348	48,411
1994	XIX	24	52	3,587,538	68,991
1998	XX	32	64	2,785,100	43,517
2002	XXI	32	64	2,705,197	42,269
2006	XXII	32	64	3,352,605	52,384
2010	XXIII	32	64	3,178,856	49,670
2014	XXIV	32	TBD		
2018	XXV	32	TBD		
2022	XXVI	32	TBD		

Table C.3 World Cup Bid Details

COUNTRY	BIDS	HOST
ARGENTINA	1938, 1962, 1970, 1978	1978
AUSTRALIA	2022	
BELGIUM	2018	
BRAZIL	1950, 1994, 2006, 2014	1950, 2014
CANADA	1986	
CHILE	1962	1962
COLOMBIA	1986	1986
EGYPT	2010	
ENGLAND	1966, 2006, 2018	1966
FRANCE	1938, 1998	1938, 1998
GERMANY	1938, 1962, 1966, 1974, 1982, 2006	1974, 2006
HUNGARY	1930	
INDONESIA	2022	
ITALY	1930, 1934, 1990	1934, 1990
JAPAN	2002, 2022	2002
LIBYA	2010	
MEXICO	1970, 1978, 1986, 2002	1970, 1986
MOROCCO	1994, 1998, 2006, 2010	
NETHERLANDS	1930, 2018	
QATAR	2022	2022
PORTUGAL	2018	
RUSSIA	2018	2018
SOUTH AFRICA	2006, 2010	2010
SOUTH KOREA	2002, 2022	2002
SPAIN	1930, 1966, 1974, 1982, 2018	1982
SWEDEN	1958	1958
SWITZERLAND	1954, 1998	1954
TUNISIA	2010	
UNITED STATES	1986, 1994, 2022	1994
URUGUAY	1930	1930

APPENDIX D

PROFESSIONAL SPORTS LEAGUES AND STATISTICS

Table D.1 Largest Stadiums in the World (100,000+ Capacity)

LOCATION	TENANT/USE	CITY	STADIUM	CAPACITY	BUILT	SEATS
USA	Race-use	Speedway	Indianapolis Speedway	257 325	1909	all-seater
JPN	Horse-Racing use	Tokyo	Tokyo Racecourse	223 000	1933	13 750
CHN	Race-use	Shanghai	Shanghai Int'l Circuit	200 000	2004	all-seater
JPN	Horse-Racing use	Chiba	Nakayama Racecourse	165 676	1990	15 944
USA	Race-use	Bristol	Bristol Motor Speedway	160 000	1961	all-seater
JPN	Race-use	Suzuka	Suzuka Circuit	155 000	1962	-
TUR	Race-use	Istanbul	Istanbul Park	155 000	2005	35 000
PRK	National Stadium	Pyongyang	Rungrado May First	150 000	1989	all-seater
DEU	Race-use	Nürburg	Nürburgring	150 000	1927	all-seater
USA	Race-use	Daytona Beach	Daytona Int'l Speedway	147 000	1959	all-seater
USA	Race-use	Concord	Charlotte Motor Speedway	146 000	1959	all-seater
ESP	Race-use	Montmeló	Circuit de Catalunya	140 700	1991	-
JPN	Horse-Racing use	Hyogo	Hanshin Racecourse	139 877	1991	12 603
USA	Race-use	Fort Worth	Texas Motor Speedway	138 122	1997	all-seater
ITA	Race-use	Monza	Autodromo di Monza	137 000	1922	77 000
KOR	Race-use	Yeongam	Korea International Circuit	135 000	2010	all-seater
USA	Race-use	Dover	Dover Int'l Speedway	133 000	1969	all-seater
USA	Race-use	Las Vegas	Las Vegas Motor Speedway	131 000	1996	all-seater
AUS	Horse Racing-use	Melbourne	Flemington Racecourse	130 000	1927	-
IND	Football-use	Calcutta	Saltlake Stadium	120 000	1984	all-seater
JPN	Horse-Racing use	Kyoto	Kyoto Racecourse	120 000	1999	28 000
DEU	Race-use	Hockenheim	Hockenheimring	120 000	1932	all-seater
DEU	Race-use	Klettwitz	EuroSpeedway Lausitz	120 000	2000	25 000
ESP	Race-use	Cheste	Circuit Ricardo Tormo	120 000	2000	60 000
GBR	Horse Racing-use	Epsom	Epsom Downs Racecourse	120 000	-	-
USA	Horse Racing-use	Louisville	Churchill Downs	120 000	1895	48 500
USA	Race-use	Austin	Circuit of the Americas	120 000	2012	all-seater
USA	Race-use	Sparta	Kentucky Speedway	117 000	2000	all-seater
JPN	Race-use	Oyama	Fuji Speedway	110 000	1960	-
USA	UM Wolverines	Ann Arbor	Michigan Stadium	109 901	1927	all-seater
USA	PSU Nittany Lions	University Park	Beaver Stadium	107 282	1960	all-seater
MEX	América	Mexico City	Estadio Azteca	105 064	1966	79 923
USA	Dallas Cowboys	Arlington	AT&T Stadium	105 000	2009	80 000
USA	Ohio State Buckeyes	Columbus	Ohio Stadium	102 329	1922	all-seater
USA	Tennessee Volunteers	Knoxville	Neyland Stadium	102 037	1921	all-seater
USA	Alabama Crimson Tide	Tuscaloosa	Bryant Denny Stadium	101 821	1929	all-seater
MYS	National Stadium	Kuala Lumpur	Bukit Jalil Stadium	100 200	1998	all-seater
USA	Texas Longhorns	Austin	DKR-Texas Memorial Stadium	100 119	1924	all-seater
FRA	Race-use	Le Mans	Circuit Bugatti	100 000	1965	all-seater
NLD	Race-use	Assen	TT Circuit Assen	100 000	1955	60 000
PRT	Race-use	Portimão	Autódromo do Algarve	100 000	2008	all-seater
IND	Race-use	Greater Noida	Buddh International Circuit	100 000	2011	all-seater
CAN	Race-use	Montréal	Circuit Gilles Villeneuve	100 000	1978	-
MEX	Race-use	Mexico City	Autódromo H. Rodríguez	100 000	1960	all-seater
AUS	Multi-use	Melbourne	Melbourne Cricket Ground	100 000	1853	all-seater
ARG	Horse-Racing use	San Isidro	Hipódromo de San Isidro	100 000	1935	-

Table D.2 Most Expensive Stadiums in the World

RANK	STADIUM	BUILT	LOCATION	2014 COST	CAPACITY
1	Meadowlands Stadium	2010	New York, NY	\$1,600,000,000	82,566
2	Yankee Stadium	2009	New York, NY	\$1,500,000,000	50,086
3	Olympic Stadium	1976	Montreal, Quebec	\$1,470,000,000	66,308
4	AT&T Stadium	2009	Dallas, TX	\$1,400,000,000	80,000
5	Wembley Stadium	2007	London, England	\$1,350,000,000	90,000
6	Madison Square Garden	1968	New York, NY	\$1,100,000,000	19,793
7	Nissan Stadium	1999	Yokohama, Japan	\$990,000,000	72,327
8	Stade de France	1998	Saint Denis, France	\$974,000,000	80,000
9	Rogers Centre	1989	Toronto, Ontario	\$930,000,000	49,539
10	Jamsil Olympic Stadium	1984	Seoul, South Korea	\$923,000,000	69,841
11	Citi Field	2009	New York, NY	\$900,000,000	41,800
12	ANZ Stadium	1999	Sydney, Australia	\$870,000,000	83,500
13	BC Place (2011)	1983	Vancouver, BC	\$835,000,000	55,000
14	Soldier Field	1923	Chicago, IL	\$788,000,000	69,000
15	The Emirates	2006	London, England	\$770,000,000	60,355
16	Louisiana Superdome	1975	New Orleans, LA	\$758,000,000	72,968
17	Lucas Oil Stadium	2008	Indianapolis, IN	\$739,000,000	63,000
18	Safeco Field	1999	Seattle, WA	\$681,000,000	47,116
19	Nationals Ballpark	2008	Washington DC	\$617,000,000	41,888
20	Lincoln Financial Field	2003	Philadelphia, PA	\$611,000,000	68,532
21	Paul Brown Stadium	2000	Cincinnati, OH	\$584,000,000	65,790
22	Aviva Stadium	2010	Dublin, Ireland	\$577,000,000	51,700
23	Etihad Stadium	2000	Melbourne, Australia	\$577,000,000	53,359
24	Ford Field	2002	Detroit, MI	\$526,000,000	65,000
25	Qwest Field	2002	Seattle, WA	\$526,000,000	67,000
26	Estadio A. V. Liberti	1938	Buenos Aires, Argentina	\$525,000,000	65,645
27	Allianz Arena	2005	Munich, Germany	\$516,000,000	69,901
28	Miller Park	2001	Milwaukee, WI	\$514,000,000	45,808
29	American Airlines Center	2001	Dallas, TX	\$500,000,000	18,532
30	University of Phoenix	2006	Phoenix, AZ	\$499,000,000	63,400
31	Staples Center	1999	Los Angeles, CA	\$494,000,000	19,079
32	Pepsi Center	1999	Denver, CO	\$476,000,000	19,155
33	Chase Field	1998	Phoenix, AZ	\$474,000,000	49,033
34	Comerica Park	2000	Detroit, MI	\$463,000,000	45,010
35	Network Associates Coliseum	1966	Oakland, CA	\$461,000,000	63,026
36	Melbourne Cricket Ground	1854	Melbourne, Australia	\$455,000,000	100,018
37	Invesco Field	2001	Denver, CO	\$452,000,000	76,125
38	Beijing National Stadium	2008	Beijing, China	\$435,000,000	91,000
39	Olympic Stadium	1982	Athens, Greece	\$431,000,000	71,030
40	Reliant Stadium	2002	Houston, TX	\$430,000,000	71,500
41	Abuja Stadium	2003	Abuja, Nigeria	427	60,491
42	Donbass Arena	2009	Donetsk, Ukraine	420	51,504
43	AT&T Park	2000	San Francisco, CA	417	41,915
44	Croke Park	1913	Dublin, Ireland	406	82,300
45	Santiago Bernabeu	1947	Madrid, Spain	406	80,354
46	Citizens Bank Park	2004	Philadelphia, PA	405	46,528
47	Edward Jones Dome	1995	St. Louis, MO	404	66,965
48	Busch Stadium	2006	St. Louis, MO	400	43,975
49	Gillette Stadium	2002	Foxborough, MA	397	68,756
50	Olympiastadion	1936	Berlin, Germany	391	74,228

Table D.3: Professional Sports Leagues of the World

AUTO RACING
AMERICAN LE MANS SERIES
ARENA RACING USA
ASIAN LE MANS SERIES
BRITISH TOURING CAR CHAMPIONSHIP
D1 GRAND PRIX
DEUTSCHE TOURENWAGEN MASTERS
EUROPEAN LE MANS SERIES
FIA GT1 WORLD CHAMPIONSHIP
FIA WORLD ENDURANCE CHAMPIONSHIP
FORMULA ONE
FORMULA TRUCK
FORMULA TWO
GRAND-AM ROAD RACING
INDYCAR
NASCAR
NATIONAL HOT ROD ASSOCIATION
PIRELLI WORLD CHALLENGE
STOCK CAR BRASIL
SUPER GT
TC 2000
TOP RACE
TURISMO CARRETERA
V8 SUPERCARS
WORLD RALLY CHAMPIONSHIP
WORLD TOURING CAR CHAMPIONSHIP

BADMINTON
INDIAN BADMINTON LEAGUE
NATIONAL BADMINTON LEAGUE

BASEBALL - ASIA
CHINA:
CHINA BASEBALL LEAGUE
REPUBLIC OF CHINA (TAIWAN):
CHINESE PROFESSIONAL BASEBALL LEAGUE
SOUTH KOREA:
MAJOR: KOREA PROFESSIONAL BASEBALL
MINOR: FUTURE'S LEAGUE
JAPAN:
NIPPON PROFESSIONAL BASEBALL
MAJOR:
CENTRAL LEAGUE
PACIFIC LEAGUE
MINOR:
EASTERN LEAGUE
WESTERN LEAGUE
INDEPENDENT:
BASEBALL CHALLENGE LEAGUE
KANSAI INDEPENDENT BASEBALL LEAGUE
SHIKOKU ISLAND LEAGUE PLUS

BASEBALL - OCEANIA
AUSTRALIA
AUSTRALIAN BASEBALL LEAGUE

BASEBALL - AMERICAS
UNITED STATES AND CANADA
MAJOR LEAGUE BASEBALL:
AL - AMERICAN LEAGUE
NL - NATIONAL LEAGUE
MINOR LEAGUE BASEBALL:
AAA: IL - INTERNATIONAL LEAGUE
AAA: PCL - PACIFIC COAST LEAGUE
AA: EL - EASTERN LEAGUE
AA: SL - SOUTHERN LEAGUE
AA: TL - TEXAS LEAGUE
A+: CALL - CALIFORNIA LEAGUE
A+: CARL - CAROLINA LEAGUE
A+: FSL - FLORIDA STATE LEAGUE
A: MWL - MIDWEST LEAGUE
A: SAL - SOUTH ATLANTIC LEAGUE
SSA: NYPL - NEW YORK-PENN LEAGUE
SSA: NWL - NORTHWEST LEAGUE
R+: APL - APPALACHIAN LEAGUE
R+: PL - PIONEER LEAGUE
R: AZL - ARIZONA LEAGUE
R: GCL - GULF COAST LEAGUE
INDEPENDENT BASEBALL:
AMERICAN ASSOCIATION OF INDEPENDENT PROFESSIONAL BASEBALL
ATLANTIC LEAGUE OF PROFESSIONAL BASEBALL
CANADIAN-AMERICAN ASSOCIATION OF PROFESSIONAL BASEBALL
FRONTIER LEAGUE
NORTH AMERICAN LEAGUE
PECOS LEAGUE
COLOMBIA
COLOMBIAN PROFESSIONAL BASEBALL LEAGUE
DOMINICAN REPUBLIC
DOMINICAN SUMMER LEAGUE
DOMINICAN PROFESSIONAL BASEBALL LEAGUE
MEXICO
MEXICAN LEAGUE
MEXICAN PACIFIC LEAGUE
NICARAGUA
NICARAGUAN PROFESSIONAL BASEBALL LEAGUE
PANAMA
PANAMANIAN PROFESSIONAL BASEBALL LEAGUE
PUERTO RICO
PUERTO RICO BASEBALL LEAGUE
VENEZUELA
VENEZUELAN SUMMER LEAGUE
VENEZUELAN PROFESSIONAL BASEBALL LEAGUE

BASEBALL - EUROPE
ITALY
ITALIAN BASEBALL LEAGUE 1D
ITALIAN BASEBALL LEAGUE 2D
NETHERLANDS
HONKBAL HOOFDKLASSE
HONKBAL OVERGANGSKLASSE
HONKBAL ROOKIE LEAGUE

BOWLING
PROFESSIONAL BOWLERS ASSOCIATION

Table D.3: Professional Sports Leagues of the World (continued)

BASKETBALL
A-1 LIGA
AMERICAN BASKETBALL ASSOCIATION
ASEAN BASKETBALL LEAGUE
BALTIC BASKETBALL LEAGUE
BASKETBALL BUNDESLIGA
BASKETBALL CHAMPIONSHIP OF BOSNIA AND HERZEGOVINA
BASKETBALL LEAGUE BELGIUM
BASKETBALL LEAGUE NORWAY
BASKETBALL LEAGUE OF SERBIA
BRITISH BASKETBALL LEAGUE (UNITED KINGDOM)
CHINESE BASKETBALL ASSOCIATION
DUTCH BASKETBALL LEAGUE
EUROCHALLENGE
EUROLEAGUE
GREEK BASKET LEAGUE
HEBA A2
HONG KONG BASKETBALL LEAGUE
HONG KONG YOUTH BASKETBALL LEAGUE
INTERNATIONAL BASKETBALL LEAGUE
IRANIAN BASKETBALL SUPER LEAGUE
KOREAN BASKETBALL LEAGUE
KORISLIIGA
LATVIAN BASKETBALL LEAGUE
LEGA BASKET SERIE A
LEGADUE
LIETUVOS KREPŠINIO LYGA
LIGA ABA
LIGA ACB
LIGA ESPAÑOLA DE BALONCESTO
LIGA FEMENINA DE BALONCESTO
LIGA NACIONAL DE BALONCESTO PROFESIONAL
LIGA NACIONAL DE BĂSQUET
LIGA TELEMACH
LIGAT HAAL
LIGUE NATIONALE DE BASKETBALL
NATIONAL BASKETBALL ASSOCIATION
NATIONAL BASKETBALL LEAGUE AUSTRALASIA
NATIONAL BASKETBALL LEAGUE INDONESIA
NATIONAL BASKETBALL LEAGUE NEW ZEALAND
NATIONAL SUPERIOR BASKETBALL
NBA DEVELOPMENT LEAGUE
NOVO BASQUETE BRASIL
OPPORTUNITY LEAGUE
PHILIPPINE BASKETBALL ASSOCIATION
POLSKA LIGA KOSZYKÓWKI
POLSKA LIGA KOSZYKÓWKI KOBIET
PREMIER BASKETBALL LEAGUE
RUSSIAN PROFESSIONAL BASKETBALL LEAGUE
RUSSIAN SUPERLEAGUE
SUPER BASKETBALL LEAGUE
TEXAS PRO BASKETBALL LEAGUE
TURKISH BASKETBALL LEAGUE
TÜRKIYE 1
UNITED STATES BASKETBALL LEAGUE
VTB UNITED LEAGUE
WOMEN'S AMERICAN BASKETBALL ASSOCIATION
WOMEN'S KOREAN BASKETBALL LEAGUE
WOMEN'S NATIONAL BASKETBALL ASSOCIATION
WOMEN'S NATIONAL BASKETBALL LEAGUE
WORLD BASKETBALL ASSOCIATION

FENCING
AMERICAN FENCING LEAGUE OFFICIAL WEBSITE

BOXING
INTERNATIONAL BOXING FEDERATION
TOP RANK BOXING
WORLD BOXING ASSOCIATION
WORLD BOXING COUNCIL
WORLD BOXING ORGANIZATION
WORLD PROFESSIONAL BOXING FEDERATION

CRICKET
ABN-AMRO CUP NATIONAL ONE-DAY CHAMPIONSHIP
BANGLADESH PREMIER LEAGUE
CARIBBEAN TWENTY20
COCA-COLA METBANK PRO50 CHAMPIONSHIP
COUNTY CHAMPIONSHIP
DEODHAR TROPHY
DULEEP TROPHY
FAYSAL BANK T20 CUP
FORD RANGER ONE DAY CUP
FRIENDS PROVIDENT TROPHY
INDIAN PREMIER LEAGUE
IRANI TROPHY
KFC TWENTY20 BIG BASH
LOGAN CUP
MTN DOMESTIC CHAMPIONSHIP
NATIONAL CRICKET LEAGUE OF BANGLADESH
NEW ZEALAND FIRST-CLASS CRICKET CHAMPIONSHIP
ONE-DAY CRICKET LEAGUE OF BANGLADESH
PATRON'S TROPHY
PENTANGULAR TROPHY
PREMIER LIMITED OVERS TOURNAMENT
PREMIER TROPHY
PRO40
QUAID-I-AZAM TROPHY
RANJI TROPHY
REGIONAL FOUR DAY COMPETITION
SHEFFIELD SHIELD
SOUTH AFRICAN AIRWAYS PROVINCIAL CHALLENGES
SRI LANKA PREMIER LEAGUE
STANBIC BANK 20 SERIES
STANDARD BANK PRO 20 SERIES
STATE CHAMPIONSHIP
STATE LEAGUE
STATE TWENTY20
SUPERSPORT SERIES
TWENTY20 CUP
VIJAY HAZARE TROPHY
WICB CUP

CYCLING
AMERICAN BICYCLE ASSOCIATION (BMX)
NATIONAL BICYCLE LEAGUE (BMX)
UCI WORLD TOUR

FIELD HOCKEY
AUSTRALIAN HOCKEY LEAGUE
DIVISIÓN DE HONOR DE HOCKEY HIERBA
ENGLAND HOCKEY LEAGUE
EURO HOCKEY LEAGUE
HOCKEY INDIA LEAGUE
MALAYSIA HOCKEY LEAGUE

Table D.3: Professional Sports Leagues of the World (continued)

FOOTBALL: ASSOCIATION
ALBANIA
SUPERLIGA
FIRST DIVISION
ALGERIA
LIGUE PROFESSIONNELLE 1
LIGUE PROFESSIONNELLE 2
ARGENTINA
PRIMERA DIVISIÓN
PRIMERA B NACIONAL
PRIMERA B METROPOLITANA
ARMENIA
PREMIER LEAGUE
FIRST LEAGUE
A-LEAGUE
AUSTRIA
BUNDESLIGA
ERSTE LIGA
AZERBAIJAN
PREMYER LIQAS?
BANGLADESH LEAGUE
BELARUS
VYSSHAYA LIGA
BELGIUM
PRO LEAGUE
SECOND DIVISION
LIGA DE FÚTBOL PROFESIONAL BOLIVIANO
BRAZIL
SÉRIE A
SÉRIE B
SÉRIE C
SÉRIE D
BULGARIA
A PFG
B PFG
CHILE
PRIMERA DIVISIÓN B
CHINESE SUPER LEAGUE
CHINESE FOOTBALL ASSOCIATION JIA LEAGUE
COLOMBIA
PRIMERA A (COPA MUSTANG)
PRIMERA B (COPA PREMIER)
CROATIA
PRVA HNL
DRUGA HNL
CYPRUS
1. DIVISION
2. DIVISION
CZECH REPUBLIC
GAMBRINUS LIGA
2. LIGA
DENMARK
1ST DIVISION
ECUADOR
SERIE A
EL SALVADOR
PRIMERA DIVISIÓN DE FÚTBOL PROFESIONAL
EGYPTIAN LEAGUE
ENGLAND
PREMIER LEAGUE
FOOTBALL LEAGUE CHAMPIONSHIP
FOOTBALL LEAGUE ONE
FOOTBALL LEAGUE TWO

FOOTBALL: ASSOCIATION
ESTONIA
MEISTRILIIGA
ESILIIGA
FINLAND
VEIKKAUSLIGA
YKKÖNEN
KAKKONEN
FRANCE
LIGUE 1
LIGUE 2
GERMANY
1ST BUNDESLIGA
2ND BUNDESLIGA
3RD LIGA
GEORGIA
UMAGLESI LIGA
PIRVELI LIGA
GHANA
GLO PREMIER LEAGUE
POLY TANK DIVISION ONE LEAGUE
DIVISION TWO LEAGUE
DIVISION THREE LEAGUE
GREECE
SUPERLEAGUE GREECE
BETA ETHNIKI
HONDURAS
LIGA NACIONAL DE HONDURAS
HONG KONG
HONG KONG FIRST DIVISION LEAGUE
HUNGARY
SOPRONI LIGA
NB II
I-LEAGUE
I LEAGUE 2ND DIVISION
INDONESIA
INDONESIA SUPER LEAGUE
LIGA INDONESIA PREMIER DIVISION
IRAN
PERSIAN GULF CUP (PREMIER LEAGUE)
AZADEGAN LEAGUE (1ST DIVISION)
3RD DIVISION
IRAQ SUPER LEAGUE
ISRAELI PREMIER LEAGUE (PREMIER LEAGUE)
ITALY
SERIE A
SERIE B
LEGA PRO PRIMA DIVISIONE
LEGA PRO SECONDA DIVISIONE
JAPAN
J. LEAGUE DIVISION 1
J. LEAGUE DIVISION 2
JAPAN FOOTBALL LEAGUE
KAZAKHSTAN
KAZAKHSTAN SUPER LEAGUE
KUWAIT
KUWAITI PREMIER LEAGUE
KYRGYZSTAN
KYRGYZSTAN LEAGUE
KYRGYZSTAN LEAGUE SECOND LEVEL
LATVIA
VIRSLIGA
1. LIGA

Table D.3: Professional Sports Leagues of the World (continued)

FOOTBALL: ASSOCIATION
LITHUANIA
A LYGA
1 LYGA
LUXEMBOURG
NATIONAL DIVISION
DIVISION OF HONOUR
MACEDONIA
MAKEDONSKA PRVA LIGA
MAKEDONSKA VTORA LIGA
MALAYSIA
MALAYSIA SUPER LEAGUE
MALAYSIA PREMIER LEAGUE
MEXICO
LIGA DE ASCENSO
SEGUNDA DIVISIÓN
TERCERA DIVISIÓN
MOLDOVA
DIVIZIA NATIONALA
MONTENEGRO
MONTENEGRIN FIRST LEAGUE
MONTENEGRIN SECOND LEAGUE
NETHERLANDS
EREDIVISIE
EERSTE DIVISIE
NORWAY
TIPPELIGAEN
ADECCOLIGAEN
PAKISTAN
GEO SUPER FOOTBALL LEAGUE
PAKISTAN PREMIER LEAGUE
PARAGUAY
DIVISIÓN INTERMEDIA
PARAGUAYAN PRIMERA DIVISIÓN B
PHILIPPINES + LEAGUES
UNITED FOOTBALL LEAGUE
UNITED FOOTBALL CUP
POLAND
EKSTRAKLASA
PORTUGAL
PRIMEIRA LIGA
LIGA DE HONRA
QATAR
QATAR NATIONAL FIRST DIVISION
ROMANIA
LIGA I
LIGA II
RUSSIA
RUSSIAN PREMIER LEAGUE
NATIONAL LEAGUE CHAMPIONSHIP
SAUDI ARABIA
SAUDI PREMIER LEAGUE
SCOTLAND
SCOTTISH PREMIER LEAGUE
SCOTTISH FIRST DIVISION
SERBIA
SERBIAN SUPERLIGA
SERBIAN FIRST LEAGUE
SINGAPORE
SINGAPORE PROFESSIONAL FOOTBALL LEAGUE (S.LEAGUE)
SLOVAKIA
CORGON LIGA
SLOVAK FIRST LEAGUE

FOOTBALL: ASSOCIATION
SLOVENIA
1. SNL
2. SNL
3. SNL
SOUTH AFRICA
PREMIER SOCCER LEAGUE
SOUTH KOREA
K LEAGUE CLASSIC
K LEAGUE CHALLENGE
SPAIN
PRIMERA DIVISION
SEGUNDA DIVISION
SEGUNDA DIVISION B
TERCERA DIVISIÓN
SWEDEN
ALLSVENSKAN
SUPERETTAN
SWITZERLAND
SWISS SUPER LEAGUE
CHALLENGE LEAGUE
SYRIA
SYRIAN LEAGUE
TRINIDAD AND TOBAGO
PROFESSIONAL FOOTBALL LEAGUE
TURKEY
SPOR TOTO SUPER LEAGUE
TFF FIRST LEAGUE
TFF SECOND LEAGUE
TFF THIRD LEAGUE
UKRAINE
UKRAINIAN PREMIER LEAGUE
UKRAINIAN FIRST LEAGUE
UNITED ARAB EMIRATES
UAE LEAGUE
UNITED STATES OF AMERICA
MAJOR LEAGUE SOCCER
NORTH AMERICAN SOCCER LEAGUE
USL PRO
NATIONAL WOMEN'S SOCCER LEAGUE
UZBEKISTAN
UZBEK LEAGUE
VIETNAM
V-LEAGUE
VIETNAM FIRST DIVISION
WALES
WELSH PREMIER LEAGUE

FOOTBALL: AUSTRALIAN RULES
AUSTRALIAN FOOTBALL LEAGUE

FOOTBALL: GAELIC FOOTBALL
ALLIANZ NATIONAL FOOTBALL LEAGUE
ALL-IRELAND SENIOR CLUB FOOTBALL CHAMPIONSHIP

FOOTBALL: GRIDIRON
CANADIAN FOOTBALL LEAGUE
GERMAN FOOTBALL LEAGUE
GERMAN FOOTBALL LEAGUE 2
NATIONAL FOOTBALL LEAGUE
X-LEAGUE

Table D.3: Professional Sports Leagues of the World (continued)

FOOTBALL: FUTSAL
DIVISION DE HONOR ARGENTINA
BRAZILIAN LIGA FUTSAL
LIGA DE FUTSAL DE GUATEMALA
INDONESIAN FUTSAL LEAGUE
IRANIAN FUTSAL SUPER LEAGUE
ITALIAN SERIE A1
KYRGYZSTAN FUTSAL LEAGUE
JAPANESE F. LEAGUE
FK-LEAGUE
PORTUGUESE FUTSAL FIRST DIVISION
DIVISIÓN DE HONOR SPAIN
RUSSIAN FUTSAL SUPER LEAGUE
TURKISH FUTSAL CHAMPIONSHIP
UZBEKISTAN FUTSAL LEAGUE

GOLF: MEN'S
ALPS TOUR
ASIAN TOUR
CHALLENGE TOUR
CHAMPIONS TOUR
EPD TOUR
EUROPEAN SENIORS TOUR
GATEWAY TOUR
JAPAN CHALLENGE TOUR
JAPAN GOLF TOUR
MINOR LEAGUE GOLF TOUR
NGA PRO GOLF TOUR
NORDIC LEAGUE
ONEASIA TOUR
PGA EUROPEAN TOUR
PGA EUROPRO TOUR
PGA TOUR
PGA TOUR CANADA
PGA TOUR OF AUSTRALASIA
SAS MASTERS TOUR
SATELLITE TOUR
SUNSHINE TOUR
WEB.COM TOUR

GOLF: WOMEN'S
ALPG TOUR
LADIES ASIAN GOLF TOUR
LADIES EUROPEAN TOUR
LADIES EUROPEAN TOUR ACCESS SERIES
LEGENDS TOUR
LPGA TOUR
LPGA OF JAPAN TOUR
LPGA OF KOREA TOUR
SAS MASTERS TOUR
STEP UP TOUR
SYMETRA TOUR

HOCKEY: INLINE
LIGUE ELITE
MAJOR LEAGUE ROLLER HOCKEY
PROFESSIONAL INLINE HOCKEY ASSOCIATION

HOCKEY: ICE
1. NÁRODNÍ HOKEJOVÁ LIGA
AMERICAN HOCKEY LEAGUE
ASIA LEAGUE ICE HOCKEY
BELARUSIAN EXTRALEAGUE
CENTRAL HOCKEY LEAGUE
CZECH EXTRALIGA
DEUTSCHE EISHOCKEY LIGA
ECHL
ELITE ICE HOCKEY LEAGUE
ELITSERIEN
EREDIVISIE
ERSTE BANK EISHOCKEY LIGA
FEDERAL HOCKEY LEAGUE
GET-LIGAEN
KAZAKHSTANI CHAMPIONSHIP
KONTINENTAL HOCKEY LEAGUE
LATVIAN HOCKEY LEAGUE
LIGUE MAGNUS
LITHUANIA HOCKEY LEAGUE
MOL LIGA
NATIONAL HOCKEY LEAGUE
NATIONALLIGA A
POLSKA LIGA HOKEJOWA
PROFESSIONAL HOCKEY LEAGUE
RUSSIAN HOCKEY LEAGUE
RUSSIAN MAJOR LEAGUE
SERIE A
SLOVAK 1.LIGA
SLOVAK EXTRALIGA
SM-LIIGA
SOUTHERN PROFESSIONAL HOCKEY LEAGUE
TURKISH ICE HOCKEY SUPER LEAGUE

MIXED MARTIAL ARTS
ART OF WAR FIGHTING CHAMPIONSHIP
BAMMA
BELLATOR FIGHTING CHAMPIONSHIPS
DEEP
DREAM
FINNFIGHT
JUNGLE FIGHT CHAMPIONSHIP
KING OF THE CAGE
KONFRONTACJA SZTUK WALKI
LEGEND FIGHTING CHAMPIONSHIP
M-1 GLOBAL
MAXIMUM FIGHTING CHAMPIONSHIP
ONE FIGHTING CHAMPIONSHIP
PACIFIC XTREME COMBAT
PANCRASE
RISINGON
ROAD FIGHTING CHAMPIONSHIP
SHARK FIGHTS
SHOOTO
STRIKEFORCE
TACHI PALACE FIGHTS
TITAN FIGHTING CHAMPIONSHIPS
TOP FIGHTING CHAMPIONSHIP
ULTIMATE FIGHTING CHAMPIONSHIP
UNITED GLORY
UNIVERSAL REALITY COMBAT CHAMPIONSHIP
ZST

Table D.3: Professional Sports Leagues of the World (continued)

LACROSSE
CANADIAN LACROSSE LEAGUE
MAJOR LEAGUE LACROSSE
MAJOR SERIES LACROSSE
NATIONAL LACROSSE LEAGUE
WESTERN LACROSSE ASSOCIATION

TEAM HANDBALL
DANISH HANDBALL LEAGUE
GERMAN BUNDESLIGA
SPANISH LIGA ASOBAL
CHAMPIONNAT DE FRANCE DE HANDBALL
IRANIAN HANDBALL SUPER LEAGUE

MOTORCYCLE RACING
ALLSVENSKAN
AMA SUPERBIKE CHAMPIONSHIP
ELITSERIEN
GRAND PRIX MOTORCYCLE RACING
NATIONAL LEAGUE
PREMIER LEAGUE
SKY SPORTS ELITE LEAGUE
SPEEDWAY EKSTRALIGA
SUPERBIKE WORLD CHAMPIONSHIP

TENNIS
ASSOCIATION OF TENNIS PROFESSIONALS
INTERNATIONAL TENNIS FEDERATION
WOMEN'S TENNIS ASSOCIATION
WORLD TEAM TENNIS

TRACK AND FIELD
IAAF DIAMOND LEAGUE

ULTIMATE DISC
AMERICAN ULTIMATE DISC LEAGUE
STARLEAGUE
GOMTV GLOBAL STARCRAFT II LEAGUE

RUGBY LEAGUE
AMERICAN NATIONAL RUGBY LEAGUE
AVIVA PREMIERSHIP
CHAMPIONSHIP
CHAMPIONSHIP 1
CURRIE CUP
FRENCH ELITE CHAMPIONSHIP
IRB SEVENS WORLD SERIES
ITM CUP
LEBANON CHAMPIONSHIP
NATIONAL CHAMPIONSHIP OF EXCELLENCE
NATIONAL RUGBY LEAGUE
NATIONAL RUGBY LEAGUE
NATIONAL ZONAL COMPETITION
NEW SOUTH WALES CUP
PAPUA NEW GUINEA NATIONAL RUGBY LEAGUE
PROFESSIONAL RUGBY LEAGUE
QUEENSLAND CUP
RABODIRECT PRO12
RFU CHAMPIONSHIP
RON MASSEY CUP
RUSSIAN CHAMPIONSHIP
SUPER IBÉRICA DE RUGBY
SUPER LEAGUE
SUPER RUGBY
TOP LEAGUE
USA RUGBY ELITE CUP
USA RUGBY LEAGUE
WELSH PREMIER DIVISION

VOLLEYBALL
CHINESE TAIPEI ENTERPRISE VOLLEYBALL LEAGUE
CHINESE VOLLEYBALL LEAGUE
DOMINICAN REPUBLIC VOLLEYBALL LEAGUE
FRANCE PRO A
IRAN IRANIAN VOLLEYBALL SUPER LEAGUE
ITALY LEGA PALLAVOLO SERIE A
JAPANESE V.LEAGUE
POLAND PLUS LIGA
POLAND PLUS LIGA KOBIEĆ
PUERTO RICAN FEMALE SUPERIOR VOLLEYBALL LEAGUE
PUERTO RICAN MALE SUPERIOR VOLLEYBALL LEAGUE
RUSSIAN VOLLEYBALL SUPER LEAGUE
SOUTH KOREAN V-LEAGUE
SUPERLIGA BRASILEIRA DE VOLEIBOL
UNITED STATES ASSOCIATION OF VOLLEYBALL PROFESSIONALS

WATER POLO
AUSTRALIA AUSTRALIAN NATIONAL WATER POLO LEAGUE
FINA
ITALY SERIE A1
UNITED KINGDOM BRITISH WATER POLO LEAGUE

SOFTBALL
NATIONAL PRO FASTPITCH
NATIONAL SOFTBALL LEAGUE

WRESTLING
IMPACT WRESTLING
RING OF HONOR
WORLD WRESTLING ENTERTAINMENT

APPENDIX E

SUSTAINABILITY IN SPORTS ARCHITECTURE

Table E.1 Sustainable Practices and Technologies Currently Employed in Stadiums

Adaptability
Alternative Tenancies and Usages Mobile Seating Arrangement Retractable Roof Structure Zone-specific Power Management
Optimized Building Envelope
Ethylene Tetrafluoroethylene (ETFE) Panels "Green" Roof Cover Operable Sun-shading Operable Windows Reflective Roof Cover
Passive Environmental Systems
Daylighting Natural Ventilation
Power Consumption and Generation
Low-wattage LED Light Fixtures and Signage Photovoltaic Cell Arrays Renewable Energy Credits (RECs) Wind Turbines
Site Management
Artificial Turf Playing Surfaces Rainwater Harvesting Tree Repopulation Zero-scaping Ground Cover
Transportation
Integration with Mass Transit Bicycle Parking Underground Parking Decks
Water Consumption
Greywater Recycling Waterless Urinal Fixtures
Waste Management
Compostable Packaging Compost Toilets Construction Material Re-use Landfill Diversion Recycling Initiatives

Table E.2 Federal and Professional Organizations which oversee Sustainability

Green Sports Alliance	http://greensportsalliance.org/
Natural Resources Defense Council (NRDC)	http://www.nrdc.org/greenbusiness/guides/sports/
US Green Building Council's LEED Certification	http://www.usgbc.org/

APPENDIX F

GLOBAL STATISTICS AND DEMOGRAPHICS

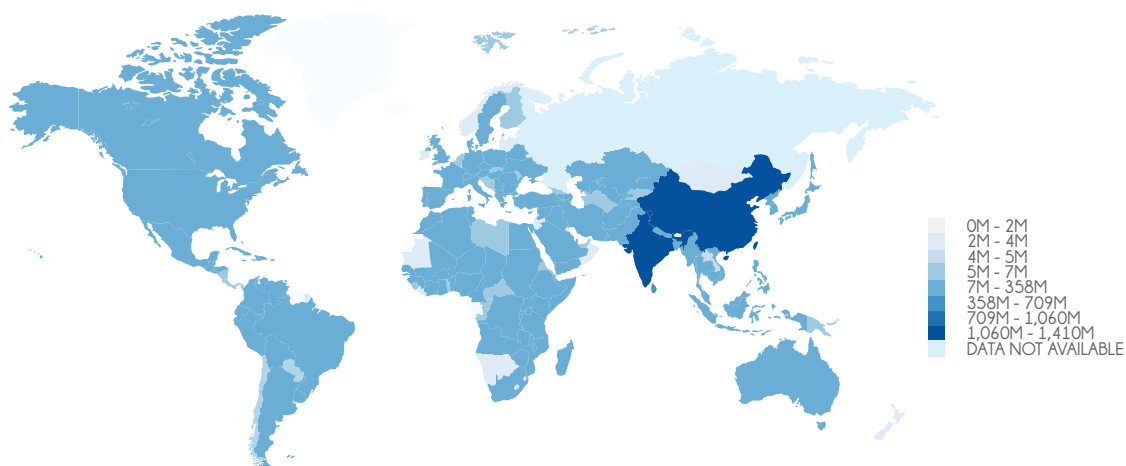


Figure F.1 Population

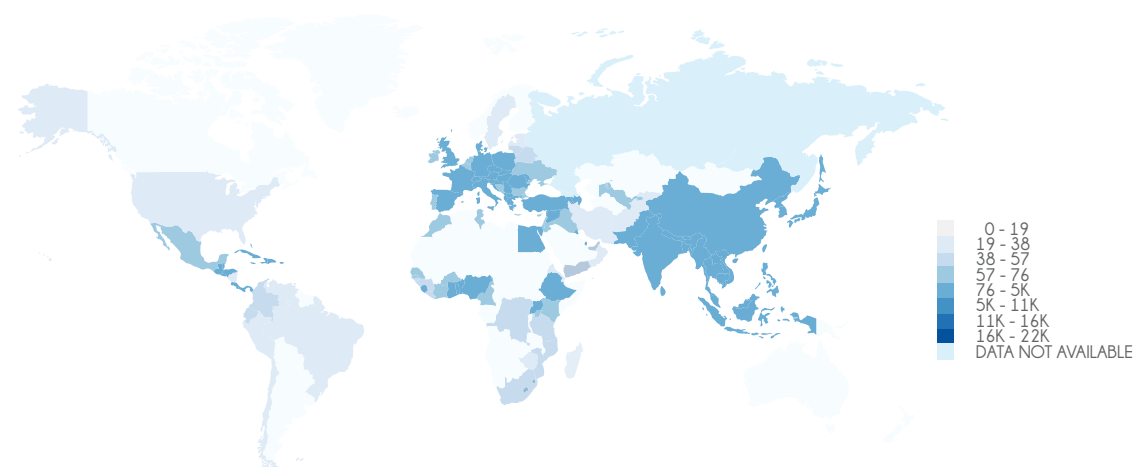


Figure F.2 Population Density (per km²)

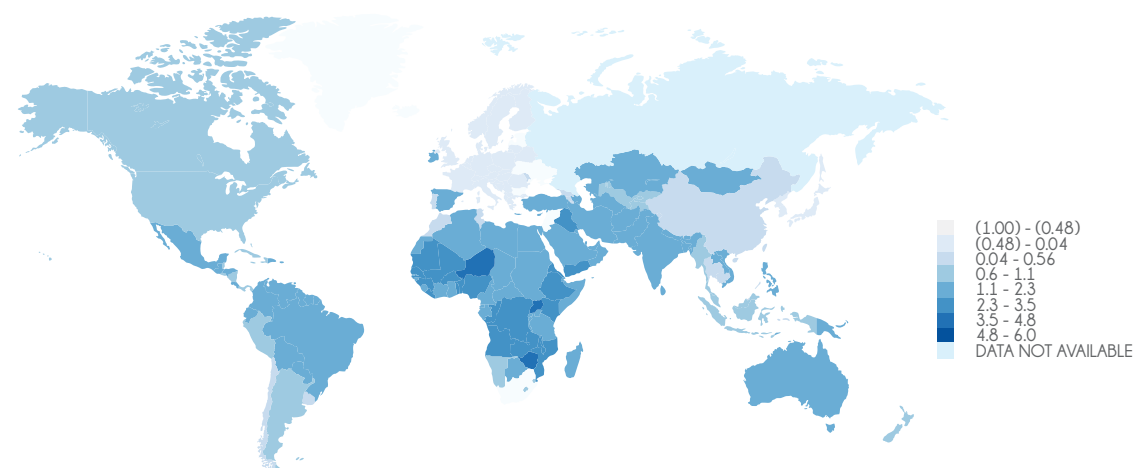


Figure F.3 Population Growth Rate (%)

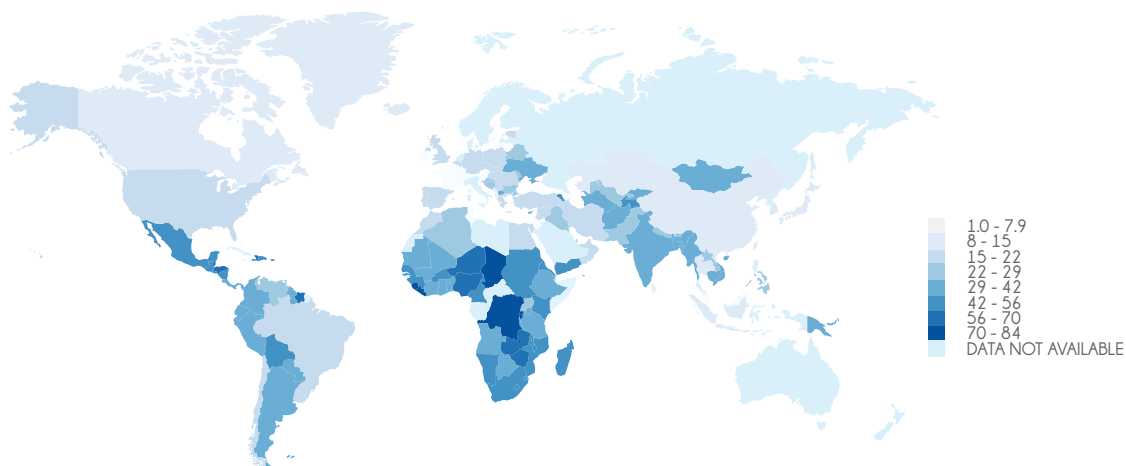


Figure F.4 Population Below Poverty Line (%)

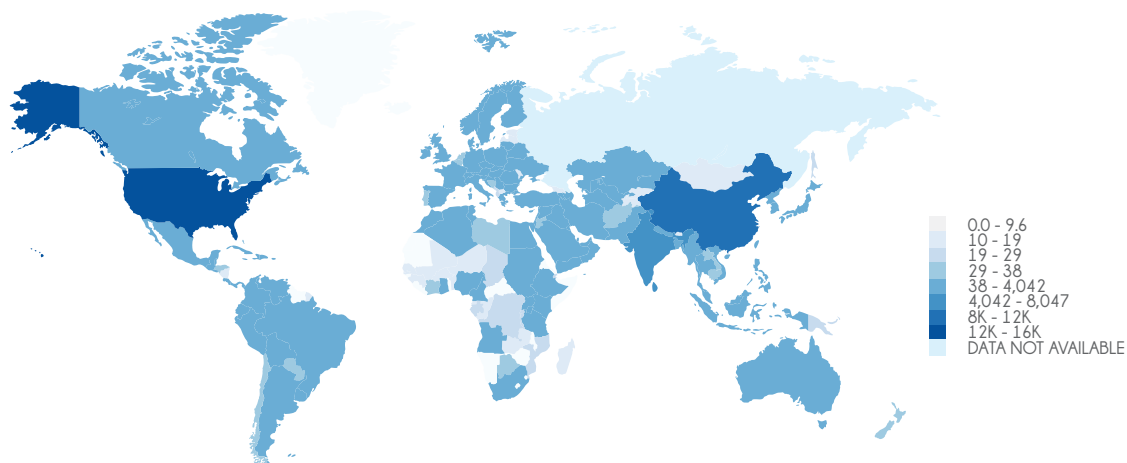


Figure F.5 Gross Domestic Product (\$Billions)

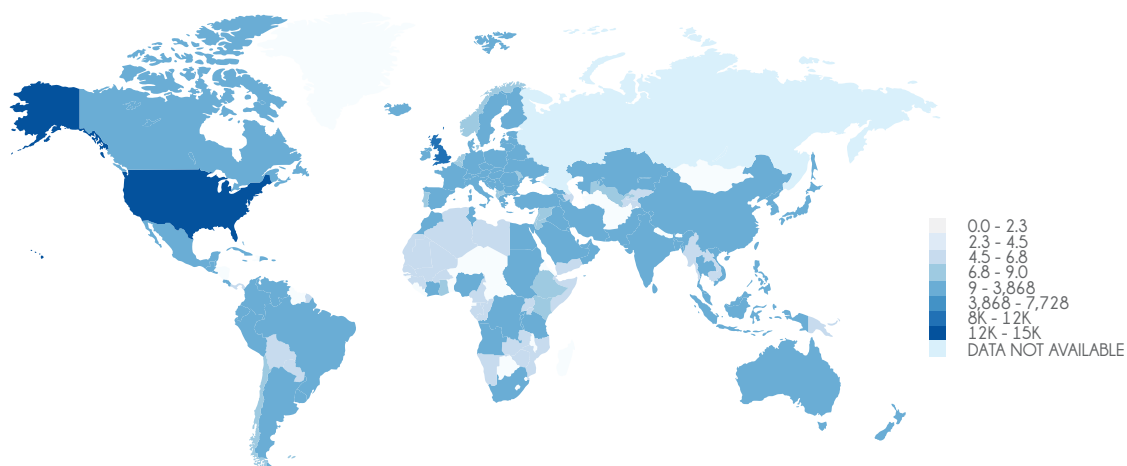


Figure F.6 National Debt (\$Billions)

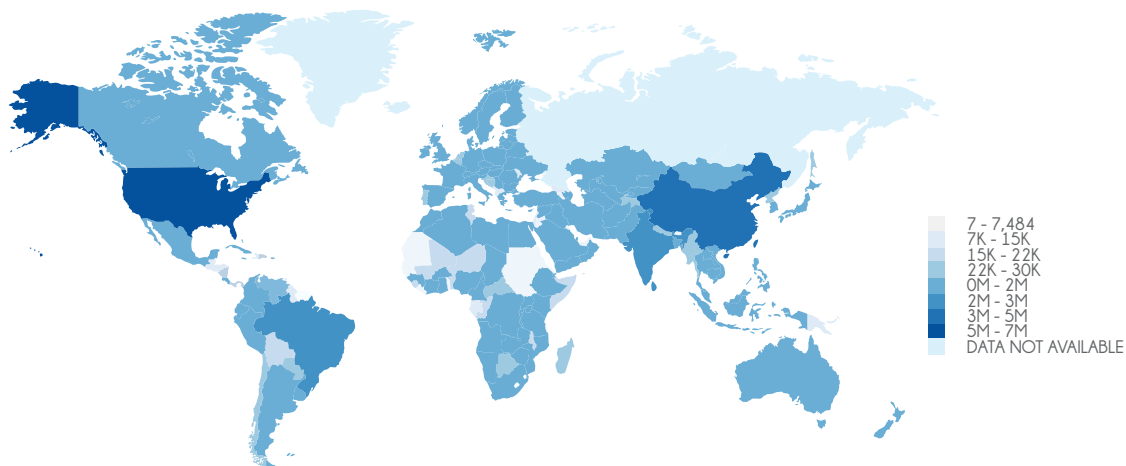


Figure F.7 Roadways (km)

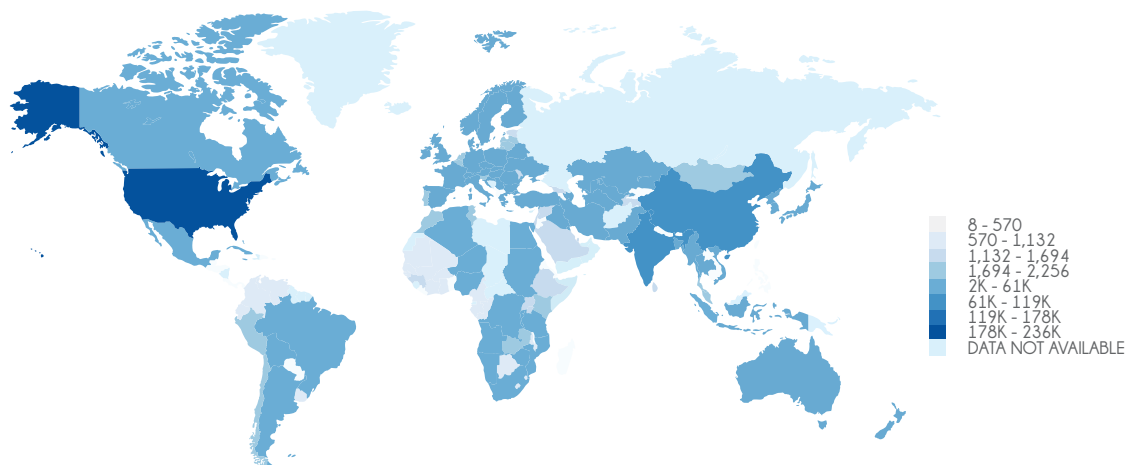


Figure F.8 Railways (km)

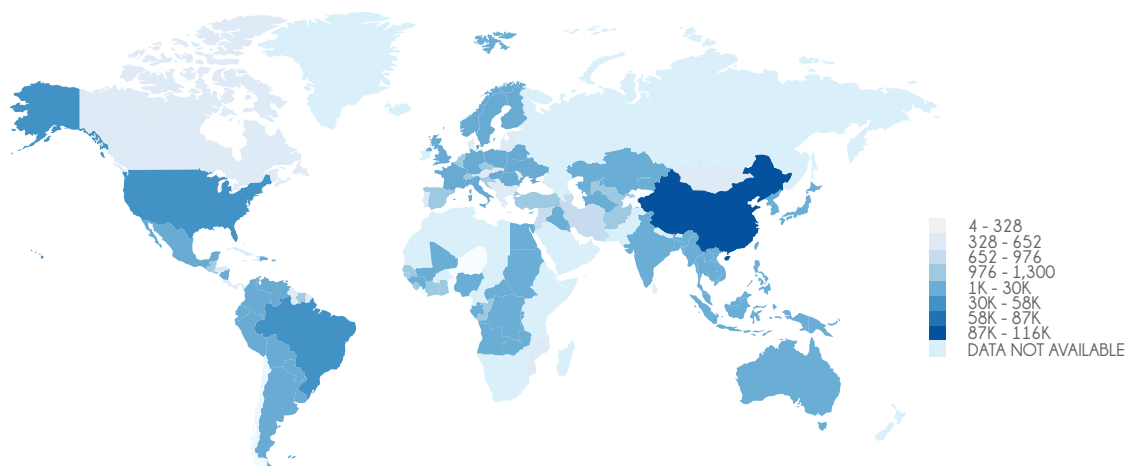


Figure F.9 Waterways (km)

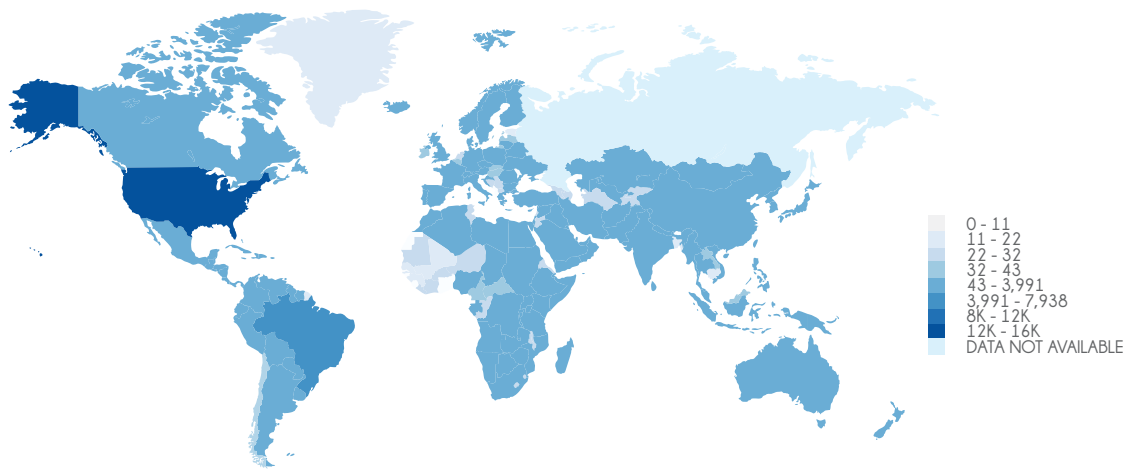


Figure F.10 Airports & Airstrips

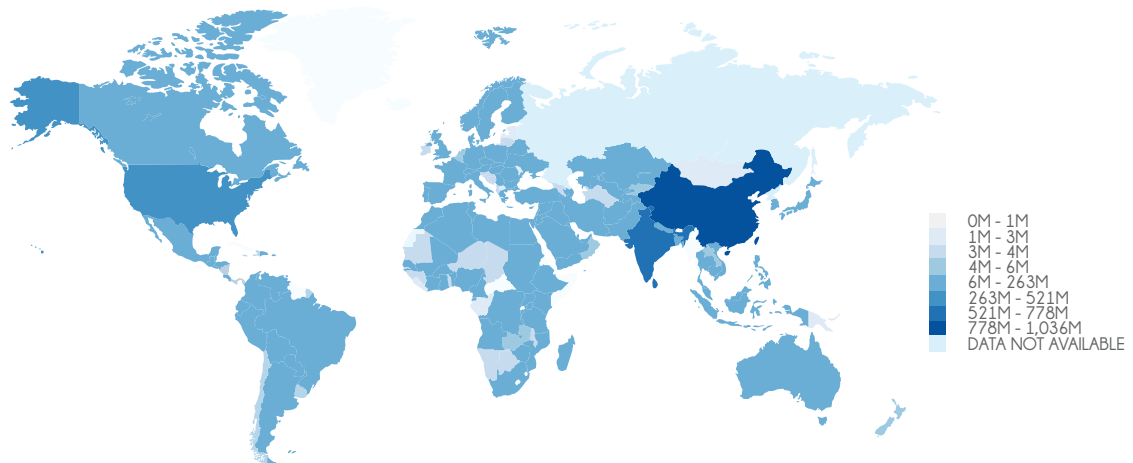


Figure F.11 Cellular Telephones

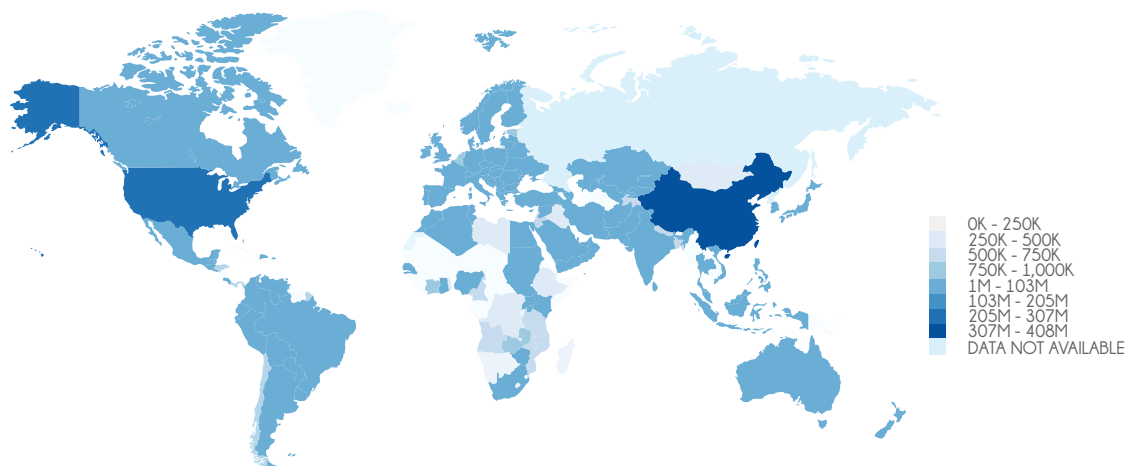


Figure F.12 Internet Users

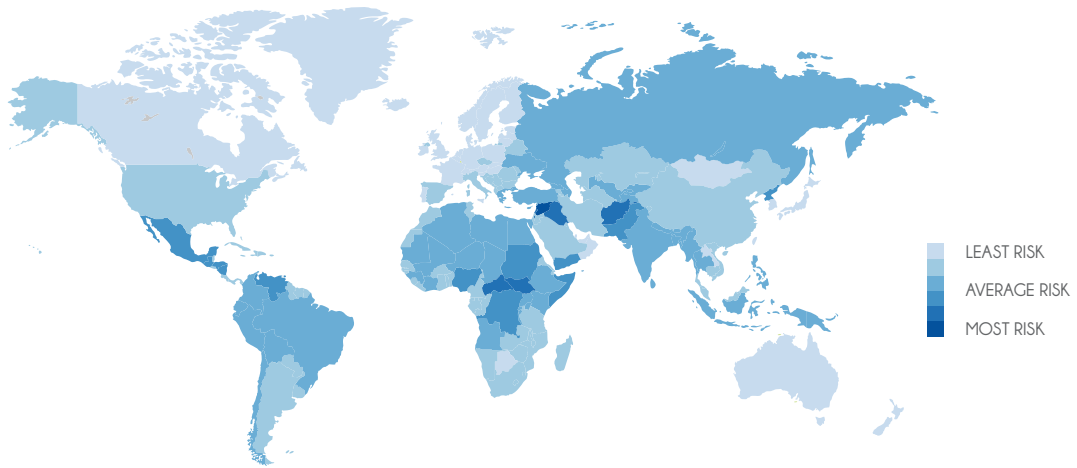


Figure F.13 Security

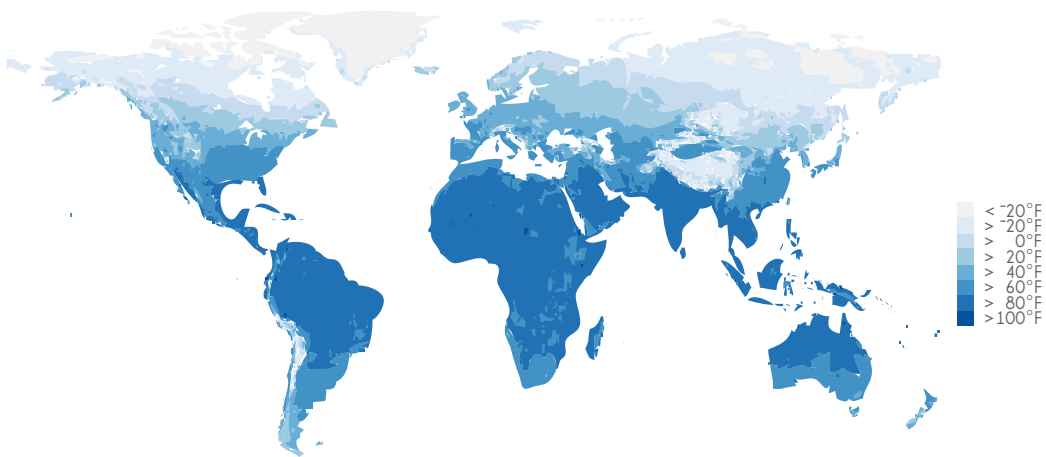


Figure F.14 Climate - Temperature

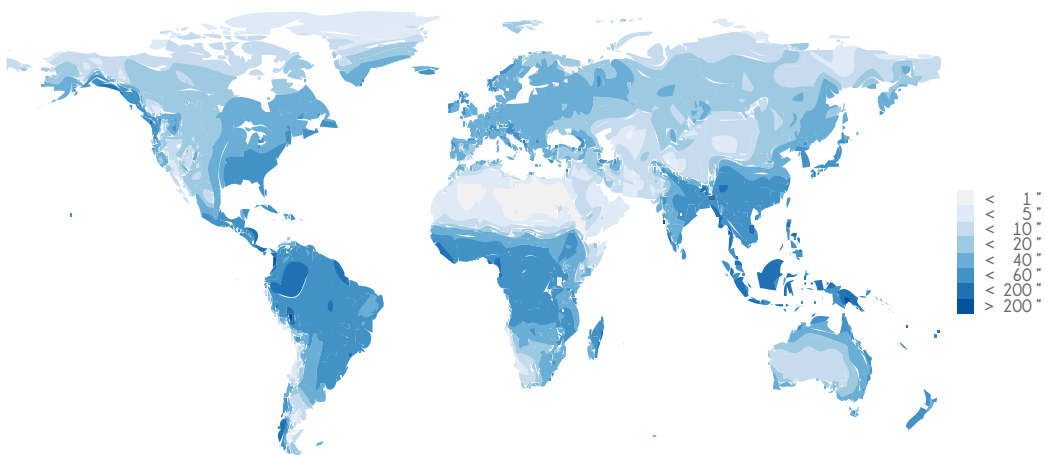


Figure F.15 Climate - Rainfall

Table F.1 Global Population Demographics

COUNTRY	POPULATION	POPULATION DENSITY (PER KM ²)	POPULATION GROWTH RATE (%)	POPULATION BELOW POVERTY LINE (%)
AFGHANISTAN	30,419,928	47	2	36
ALBANIA	3,002,859	104	0	13
ALGERIA	37,367,226	16	1	23
ANDORRA	85,082	182	0	N/A
ANGOLA	18,056,072	14	3	41
ANTIGUA AND BARBUDA	89,018	201	1	23
ARGENTINA	42,192,494	15	1	30
ARMENIA	2,970,495	100	0	34
AUSTRALIA	22,015,576	3	1	N/A
AUSTRIA	8,219,743	98	0	6
AZERBAIJAN	9,493,600	110	1	11
BAHAMAS, THE	316,182	23	1	9
BAHRAIN	1,248,348	1,643	3	N/A
BANGLADESH	161,083,804	1,119	2	26
BARBADOS	287,733	669	0	N/A
BELARUS	9,643,566	46	0	27
BELGIUM	10,438,353	342	0	15
BELIZE	327,719	14	2	43
BENIN	9,598,787	85	3	37
BHUTAN	716,896	19	1	23
BOLIVIA	10,290,003	9	2	51
BOSNIA AND HERZEGOVINA	3,879,296	76	0	19
BOTSWANA	2,098,018	4	1	30
BRAZIL	199,321,413	23	1	26
BRUNEI	408,786	71	2	N/A
BULGARIA	7,037,935	63	-1	22
BURKINA FASO	17,275,115	63	3	46
BURMA	54,584,650	81	1	33
BURUNDI	10,557,259	379	3	68
CAMBODIA	14,952,665	83	2	31
CAMEROON	20,129,878	42	2	48
CANADA	34,300,083	3	1	9
CAPE VERDE	523,568	130	1	30
CAYMAN ISLANDS	52,560	199	2	N/A
CENTRAL AFRICAN REPUBLIC	5,057,208	8	2	N/A
CHAD	10,975,648	9	2	80
CHILE	17,067,369	23	1	12
CHINA	1,343,239,923	140	0	13
COLOMBIA	45,239,079	40	1	37
COMOROS	737,284	330	2	60
CONGO, DEMOCRATIC REPUBLIC OF THE	73,599,190	31	3	71
CONGO, REPUBLIC OF THE	4,366,266	13	3	N/A
COSTA RICA	4,636,348	91	1	24
COTE D'IVOIRE	21,952,093	68	2	42
CROATIA	4,480,043	79	0	18
CUBA	11,075,244	100	0	N/A
CZECH REPUBLIC	10,177,300	129	0	9
DENMARK	5,543,453	129	0	13
DJIBOUTI	774,389	33	2	42
DOMINICA	73,126	97	0	29
DOMINICAN REPUBLIC	10,088,598	207	1	42
EAST TIMOR	1,143,667	77	2	41
ECUADOR	15,223,680	54	1	29
EGYPT	83,688,164	84	2	20
EL SALVADOR	6,090,646	289	0	37
EQUATORIAL GUINEA	685,991	24	3	N/A
ERITREA	6,086,495	52	2	50
ESTONIA	1,274,709	28	-1	18
ETHIOPIA	91,195,675	83	3	29
FALKLAND ISLANDS (ISLAS MALVINAS)	3,140	0	0	N/A
FIJI	890,057	49	1	26
FINLAND	5,262,930	16	0	N/A
FRANCE	65,630,692	102	0	6
GABON	1,608,321	6	2	N/A
GAMBIA, THE	1,840,454	163	2	N/A
GEORGIA	4,570,934	66	0	10

Table F.1 Global Population Demographics (continued)

COUNTRY	POPULATION	POPULATION DENSITY (PER KM ²)	POPULATION GROWTH RATE (%)	POPULATION BELOW POVERTY LINE (%)
GERMANY	81,305,856	228	0	16
GHANA	24,652,402	103	2	29
GREECE	10,767,827	82	0	20
GREENLAND	57,695	0	0	9
GRENADA	109,011	317	1	38
GUATEMALA	14,099,032	129	2	54
GUINEA	10,884,958	44	3	47
GUINEA-BISSAU	1,628,603	45	2	N/A
GUYANA	741,908	3	0	35
HAITI	9,801,664	353	1	80
HOLY SEE (VATICAN CITY)	836	1,900	0	N/A
HONDURAS	8,296,693	74	2	65
HONG KONG	7,153,519	6,480	0	N/A
HUNGARY	9,958,453	107	0	14
ICELAND	313,183	3	1	N/A
INDIA	1,205,073,612	367	1	25
INDONESIA	248,645,008	131	1	13
IRAN	78,868,711	48	1	19
IRAQ	31,129,225	71	2	25
IRELAND	4,722,028	67	1	6
ISRAEL	7,590,758	365	2	24
ITALY	61,261,254	203	0	N/A
JAMAICA	2,889,187	263	1	17
JAPAN	127,368,088	337	0	16
JORDAN	6,508,887	73	-1	14
KAZAKHSTAN	17,522,010	6	1	8
KENYA	43,013,341	74	2	50
KIRIBATI	101,998	126	1	N/A
KOREA, NORTH	24,589,122	204	1	N/A
KOREA, SOUTH	48,860,500	490	0	15
KUWAIT	2,646,314	149	2	N/A
KYRGYZSTAN	5,496,737	27	1	34
LAOS	6,586,266	28	2	26
LATVIA	2,191,580	34	-1	N/A
LEBANON	4,140,289	398	0	28
LESOTHO	1,930,493	64	0	49
LIBERIA	3,887,886	35	3	80
LIBYA	5,613,380	3	2	N/A
LIECHTENSTEIN	36,713	229	1	N/A
LITHUANIA	3,525,761	54	0	4
LUXEMBOURG	509,074	197	1	N/A
MACAU	578,025	20,497	1	N/A
MACEDONIA	2,082,370	81	0	31
MADAGASCAR	22,005,222	37	3	50
MALAWI	16,323,044	138	3	53
MALAYSIA	29,179,952	88	2	4
MALI	15,494,466	12	3	36
MALTA	409,836	1,297	0	N/A
MAURITANIA	3,359,185	3	2	40
MAURITIUS	1,313,095	644	1	8
MEXICO	114,975,406	59	1	48
MOLDOVA	3,656,843	108	-1	26
MONACO	30,510	15,255	0	N/A
MONGOLIA	3,179,997	2	1	39
MONTENEGRO	657,394	48	-1	7
MOROCCO	32,309,239	72	1	15
MOZAMBIQUE	23,515,934	29	2	54
NAMIBIA	2,165,828	3	1	56
NAURU	9,378	447	1	N/A
NEPAL	29,890,686	203	2	25
NETHERLANDS	16,730,632	403	0	11
NEW CALEDONIA	260,166	14	1	N/A
NEW ZEALAND	4,327,944	16	1	N/A
NICARAGUA	5,727,707	44	1	46
NIGER	16,344,687	13	4	63
NIGERIA	170,123,740	184	3	70

Table F.1 Global Population Demographics (continued)

COUNTRY	POPULATION	POPULATION DENSITY (PER KM ²)	POPULATION GROWTH RATE (%)	POPULATION BELOW POVERTY LINE (%)
NORWAY	4,707,270	15	0	N/A
OMAN	3,090,150	10	2	N/A
PAKISTAN	190,291,129	239	2	22
PALAU	21,032	46	0	N/A
PANAMA	3,510,045	47	1	29
PAPUA NEW GUINEA	6,310,129	14	2	37
PARAGUAY	6,541,591	16	1	19
PERU	29,549,517	23	1	31
PHILIPPINES	103,775,002	346	2	10
POLAND	38,415,284	123	0	17
PORTUGAL	10,781,459	117	0	18
PUERTO RICO	3,690,923	268	0	N/A
QATAR	1,951,591	168	5	N/A
ROMANIA	21,848,504	92	0	21
RUSSIA	142,517,670	8	0	13
RWANDA	11,689,696	444	3	60
SAINT KITTS AND NEVIS	50,726	194	1	N/A
SAINT LUCIA	162,178	263	0	N/A
SAINT VINCENT AND THE GRENADINES	103,537	266	0	N/A
SAMOA	194,320	69	1	N/A
SAN MARINO	32,140	527	1	N/A
SAO TOME AND PRINCIPE	183,176	190	2	54
SAUDI ARABIA	26,534,504	12	2	N/A
SENEGAL	12,969,606	66	3	54
SERBIA	7,276,604	94	0	9
SEYCHELLES	90,024	198	1	N/A
SIERRA LEONE	5,485,998	76	2	70
SINGAPORE	5,353,494	7,681	2	N/A
SLOVAKIA	5,483,088	112	0	21
SLOVENIA	1,996,617	98	0	12
SOLOMON ISLANDS	584,578	20	2	N/A
SOMALIA	10,085,638	16	2	N/A
SOUTH AFRICA	48,810,427	40	0	50
SPAIN	47,042,984	93	1	20
SRI LANKA	21,481,334	327	1	9
SUDAN	34,206,710	18	2	40
SURINAME	560,157	3	1	70
SWAZILAND	1,386,914	80	1	69
SWEDEN	9,103,788	20	0	N/A
SWITZERLAND	7,925,517	192	0	7
SYRIA	22,530,746	122	-1	12
TAIWAN	23,234,936	646	0	1
TAJIKISTAN	7,768,385	54	2	53
TANZANIA	46,912,768	50	2	36
THAILAND	67,091,089	131	1	8
TOGO	6,961,049	123	3	32
TONGA	106,146	142	0	24
TRINIDAD AND TOBAGO	1,226,383	239	0	17
TUNISIA	10,732,900	66	1	4
TURKEY	79,749,461	102	1	17
TURKMENISTAN	5,054,828	10	1	30
TUVALU	10,619	408	1	N/A
UGANDA	33,640,833	140	4	35
UKRAINE	44,854,065	74	-1	35
UNITED ARAB EMIRATES	5,314,317	64	3	20
UNITED KINGDOM	63,047,162	259	1	14
UNITED STATES	313,847,465	32	1	15
URUGUAY	3,316,328	19	0	7
UZBEKISTAN	28,394,180	63	1	26
VANUATU	256,155	21	1	N/A
VENEZUELA	28,047,938	31	1	27
VIETNAM	91,519,289	276	1	15
WESTERN SAHARA	522,928	2	3	N/A
YEMEN	24,771,809	47	3	45
ZAMBIA	13,817,479	18	3	64
ZIMBABWE	12,619,600	32	4	68

Table F.2 Global Economic Statistics

COUNTRY	GDP (\$BILLIONS)	GDP PER CAPITA (\$)	GDP GROWTH RATE (%)	PUBLIC DEBT (% OF GDP)	DEBT - EXTERNAL (\$BILLIONS)
AFGHANISTAN	30	1,000	6	N/A	1
ALBANIA	25	7,800	2	N/A	6
ALGERIA	267	7,400	3	N/A	5
ANDORRA	3	37,200	-2	N/A	N/A
ANGOLA	117	6,000	3	N/A	18
ANTIGUA AND BARBUDA	2	18,200	-1	N/A	N/A
ARGENTINA	726	17,700	9	N/A	137
ARMENIA	18	5,500	4	N/A	7
AUSTRALIA	926	40,800	2	N/A	1,376
AUSTRIA	357	42,400	3	N/A	884
AZERBAIJAN	94	10,300	0	N/A	4
BAHAMAS, THE	11	31,400	2	N/A	N/A
BAHRAIN	32	27,900	2	N/A	15
BANGLADESH	286	1,700	6	35	25
BARBADOS	7	23,700	1	N/A	N/A
BELARUS	144	15,200	5	N/A	34
BELGIUM	419	38,200	2	N/A	1,399
BELIZE	3	8,400	3	N/A	N/A
BENIN	15	1,500	3	N/A	1
BHUTAN	4	6,200	6	N/A	N/A
BOLIVIA	52	4,900	5	N/A	5
BOSNIA AND HERZEGOVINA	32	8,200	2	N/A	11
BOTSWANA	30	16,200	5	N/A	2
BRAZIL	2,324	11,900	3	54	398
BRUNEI	21	50,000	2	N/A	N/A
BULGARIA	102	13,800	2	N/A	47
BURKINA FASO	22	1,500	6	N/A	2
BURMA	84	1,300	6	N/A	6
BURUNDI	5	600	4	N/A	1
CAMBODIA	34	2,200	6	N/A	5
CAMEROON	48	2,300	4	N/A	3
CANADA	1,414	41,100	3	N/A	1,181
CAPE VERDE	2	4,000	5	N/A	N/A
CAYMAN ISLANDS	2	43,800	1	N/A	N/A
CENTRAL AFRICAN REPUBLIC	4	800	3	N/A	0
CHAD	20	1,900	2	N/A	2
CHILE	304	17,400	6	N/A	99
CHINA	11,440	8,500	9	44	697
COLOMBIA	478	10,400	6	N/A	69
COMOROS	1	1,200	2	N/A	N/A
CONGO, DEMOCRATIC REPUBLIC OF THE	26	400	7	N/A	15
CONGO, REPUBLIC OF THE	18	4,600	5	N/A	5
COSTA RICA	56	12,100	4	N/A	10
COTE D'IVOIRE	37	1,600	-5	N/A	11
CROATIA	81	18,400	0	N/A	66
CUBA	114	9,900	2	N/A	22
CZECH REPUBLIC	289	27,400	2	N/A	102
DENMARK	209	37,600	1	N/A	627
DJIBOUTI	2	2,700	5	N/A	N/A
DOMINICA	1	14,000	1	N/A	N/A
DOMINICAN REPUBLIC	95	9,400	5	N/A	14
EAST TIMOR	10	8,800	11	N/A	N/A
ECUADOR	129	8,600	8	N/A	10
EGYPT	526	6,600	2	83	34
EL SALVADOR	45	7,600	1	N/A	13
EQUATORIAL GUINEA	26	19,600	7	N/A	N/A
ERITREA	4	700	9	N/A	1
ESTONIA	28	20,600	8	N/A	25
ETHIOPIA	96	1,100	8	44	8
FALKLAND ISLANDS (ISLAS MALVINAS)	0	55,400	N/A	N/A	N/A
FIJI	4	4,700	2	N/A	N/A
FINLAND	198	36,700	3	N/A	577
FRANCE	2,246	35,600	2	85	5,633
GABON	25	16,400	6	N/A	3
GAMBIA, THE	4	2,000	3	N/A	1
GEORGIA	25	5,600	7	N/A	11

Table F.2 Global Economic Statistics (continued)

COUNTRY	GDP (\$BILLIONS)	GDP PER CAPITA (\$)	GDP GROWTH RATE (%)	PUBLIC DEBT (% OF GDP)	DEBT - EXTERNAL (\$BILLIONS)
GERMANY	3,139	38,400	3	82	5,624
GHANA	76	3,100	14	N/A	8
GREECE	298	26,600	-7	N/A	583
GREENLAND	2	37,400	3	N/A	N/A
GRENADA	1	14,100	1	N/A	N/A
GUATEMALA	76	5,100	4	N/A	16
GUINEA	12	1,100	4	N/A	3
GUINEA-BISSAU	2	1,200	5	N/A	1
GUYANA	6	7,600	4	N/A	N/A
HAITI	13	1,300	6	N/A	1
HOLY SEE (VATICAN CITY)	N/A	N/A	N/A	N/A	N/A
HONDURAS	36	4,400	4	N/A	5
HONG KONG	356	49,800	5	N/A	903
HUNGARY	198	19,800	2	N/A	185
ICELAND	13	38,500	3	N/A	N/A
INDIA	4,515	3,700	7	49	290
INDONESIA	1,139	4,700	7	24	187
IRAN	1,003	13,200	2	12	18
IRAQ	129	3,900	10	N/A	51
IRELAND	184	40,100	1	N/A	2,352
ISRAEL	238	31,400	5	N/A	102
ITALY	1,871	30,900	0	120	2,684
JAMAICA	25	9,100	2	N/A	15
JAPAN	4,497	35,200	-1	212	2,719
JORDAN	37	6,000	3	N/A	8
KAZAKHSTAN	220	13,200	8	N/A	123
KENYA	72	1,800	5	N/A	9
KIRIBATI	1	5,800	2	N/A	N/A
KOREA, NORTH	40	1,800	4	N/A	13
KOREA, SOUTH	1,574	32,100	4	N/A	397
KUWAIT	156	42,200	8	N/A	42
KYRGYZSTAN	13	2,400	6	N/A	4
LAOS	18	2,700	8	N/A	6
LATVIA	35	15,900	6	N/A	38
LEBANON	62	15,700	2	N/A	29
LESOTHO	4	2,000	4	N/A	1
LIBERIA	2	500	6	N/A	0
LIBYA	38	14,100	3	N/A	5
LIECHTENSTEIN	5	141,100	-1	N/A	N/A
LITHUANIA	62	19,100	6	N/A	31
LUXEMBOURG	42	81,100	1	N/A	N/A
MACAU	18	33,000	1	N/A	N/A
MACEDONIA	22	10,500	3	N/A	7
MADAGASCAR	21	900	1	N/A	2
MALAWI	14	900	6	N/A	1
MALAYSIA	453	15,800	5	N/A	88
MALI	18	1,100	3	N/A	3
MALTA	11	25,800	2	N/A	N/A
MAURITANIA	7	2,200	4	N/A	3
MAURITIUS	20	15,100	4	N/A	5
MEXICO	1,683	14,800	4	35	211
MOLDOVA	12	3,400	6	N/A	5
MONACO	5	63,400	3	N/A	N/A
MONGOLIA	13	4,800	17	N/A	2
MONTENEGRO	7	11,700	3	N/A	N/A
MOROCCO	165	5,100	4	N/A	28
MOZAMBIQUE	24	1,100	7	N/A	4
NAMIBIA	16	7,500	4	N/A	5
NAURU	0	5,000	N/A	N/A	N/A
NEPAL	38	1,300	4	N/A	4
NETHERLANDS	713	42,700	1	N/A	2,655
NEW CALEDONIA	3	15,000	N/A	N/A	N/A
NEW ZEALAND	124	28,000	1	N/A	86
NICARAGUA	19	3,200	5	N/A	4
NIGER	12	800	2	N/A	1
NIGERIA	419	2,600	7	18	10

Table F.2 Global Economic Statistics (continued)

COUNTRY	GDP (\$BILLIONS)	GDP PER CAPITA (\$)	GDP GROWTH RATE (%)	PUBLIC DEBT (% OF GDP)	DEBT - EXTERNAL (\$BILLIONS)
NORWAY	269	54,200	2	N/A	645
OMAN	83	26,900	6	N/A	9
PAKISTAN	495	2,800	2	60	62
PALAU	0	8,100	6	N/A	N/A
PANAMA	51	14,300	11	N/A	13
PAPUA NEW GUINEA	17	2,600	9	N/A	5
PARAGUAY	36	5,500	4	N/A	5
PERU	306	10,200	7	N/A	37
PHILIPPINES	395	4,100	4	51	72
POLAND	782	20,600	4	N/A	320
PORTUGAL	252	23,700	-2	N/A	548
PUERTO RICO	65	16,300	-6	N/A	57
QATAR	184	104,300	19	N/A	125
ROMANIA	271	12,600	3	N/A	136
RUSSIA	2,414	17,000	4	8	519
RWANDA	14	1,400	9	N/A	1
SAINT KITTS AND NEVIS	1	15,800	-2	N/A	N/A
SAINT LUCIA	2	12,800	0	N/A	N/A
SAINT VINCENT AND THE GRENADINES	1	11,600	0	N/A	N/A
SAMOA	1	6,000	2	N/A	N/A
SAN MARINO	1	36,200	1	N/A	N/A
SAO TOME AND PRINCIPE	0	2,300	5	N/A	N/A
SAUDI ARABIA	692	24,500	7	N/A	106
SENEGAL	25	1,900	3	N/A	4
SERBIA	80	10,800	2	N/A	32
SEYCHELLES	2	25,000	5	N/A	N/A
SIERRA LEONE	5	900	5	N/A	1
SINGAPORE	319	60,500	5	N/A	24
SLOVAKIA	129	23,600	3	N/A	73
SLOVENIA	59	29,000	0	N/A	61
SOLOMON ISLANDS	2	3,200	9	N/A	N/A
SOMALIA	6	600	3	N/A	3
SOUTH AFRICA	562	11,100	3	N/A	46
SPAIN	1,432	31,000	1	N/A	2,570
SRI LANKA	118	5,700	8	N/A	23
SUDAN	90	2,800	-4	N/A	39
SURINAME	5	9,600	5	N/A	N/A
SWAZILAND	6	5,400	0	N/A	1
SWEDEN	387	40,900	4	N/A	1,016
SWITZERLAND	344	43,900	2	N/A	1,346
SYRIA	108	5,100	-2	N/A	7
TAIWAN	887	38,200	4	N/A	126
TAJIKISTAN	16	2,100	7	N/A	3
TANZANIA	65	1,500	7	N/A	9
THAILAND	610	9,500	0	41	116
TOGO	6	900	4	N/A	2
TONGA	1	7,400	2	N/A	N/A
TRINIDAD AND TOBAGO	27	20,300	-1	N/A	4
TUNISIA	102	9,600	-1	N/A	23
TURKEY	1,087	14,700	9	40	307
TURKMENISTAN	44	7,900	15	N/A	1
TUVALU	0	3,400	0	N/A	N/A
UGANDA	47	1,300	7	N/A	4
UKRAINE	334	7,300	5	N/A	124
UNITED ARAB EMIRATES	262	48,800	5	N/A	159
UNITED KINGDOM	2,290	36,600	1	86	9,836
UNITED STATES	15,290	49,000	2	68	14,710
URUGUAY	52	15,300	6	N/A	15
UZBEKISTAN	96	3,300	8	N/A	9
VANUATU	1	5,000	3	N/A	N/A
VENEZUELA	379	12,700	4	N/A	90
VIETNAM	304	3,400	6	57	40
WESTERN SAHARA	1	2,500	N/A	N/A	N/A
YEMEN	59	2,300	-11	N/A	7
ZAMBIA	22	1,600	7	N/A	4
ZIMBABWE	6	500	9	N/A	6

Table F.3 Global Infrastructural Details

COUNTRY	AIRPORTS	RAILWAYS (KM)	ROADWAYS (KM)	WATERWAYS (KM)
AFGHANISTAN	52	N/A	42,150	N/A
ALBANIA	5	N/A	18,000	N/A
ALGERIA	142	3,973	111,261	N/A
ANDORRA	N/A	N/A	320	N/A
ANGOLA	176	N/A	51,429	N/A
ANTIGUA AND BARBUDA	3	N/A	1,165	N/A
ARGENTINA	1,149	36,966	231,374	N/A
ARMENIA	11	N/A	8,888	N/A
AUSTRALIA	467	N/A	818,356	N/A
AUSTRIA	52	N/A	110,778	N/A
AZERBAIJAN	37	N/A	59,141	N/A
BAHAMAS, THE	61	N/A	2,717	N/A
BAHRAIN	4	N/A	3,851	N/A
BANGLADESH	18	2,622	239,226	N/A
BARBADOS	1	N/A	1,600	N/A
BELARUS	65	N/A	94,797	N/A
BELGIUM	43	N/A	153,595	N/A
BELIZE	43	N/A	3,007	N/A
BENIN	5	N/A	16,000	N/A
BHUTAN	2	N/A	8,050	N/A
BOLIVIA	865	N/A	16,138	N/A
BOSNIA AND HERZEGOVINA	25	N/A	22,926	N/A
BOTSWANA	76	N/A	25,798	N/A
BRAZIL	4,105	28,538	1,751,868	50,000
BRUNEI	1	N/A	2,971	N/A
BULGARIA	202	N/A	40,231	N/A
BURKINA FASO	24	N/A	92,495	N/A
BURMA	74	5,031	27,000	N/A
BURUNDI	7	N/A	12,322	N/A
CAMBODIA	16	N/A	38,093	N/A
CAMEROON	34	N/A	51,000	N/A
CANADA	1,453	46,552	1,042,300	N/A
CAPE VERDE	9	N/A	1,350	N/A
CAYMAN ISLANDS	N/A	N/A	785	N/A
CENTRAL AFRICAN REPUBLIC	40	N/A	24,307	N/A
CHAD	58	N/A	40,000	N/A
CHILE	476	N/A	80,505	N/A
CHINA	497	86,000	3,860,800	110,000
COLOMBIA	862	874	141,374	N/A
COMOROS	4	N/A	880	N/A
CONGO, DEMOCRATIC REPUBLIC OF THE	201	4,007	153,497	N/A
CONGO, REPUBLIC OF THE	25	N/A	17,289	N/A
COSTA RICA	153	N/A	38,049	N/A
COTE D'IVOIRE	27	N/A	80,000	N/A
CROATIA	69	N/A	29,343	N/A
CUBA	136	N/A	60,858	N/A
CZECH REPUBLIC	128	N/A	127,797	N/A
DENMARK	89	N/A	73,197	N/A
DJIBOUTI	13	N/A	3,065	N/A
DOMINICA	N/A	N/A	780	N/A
DOMINICAN REPUBLIC	36	N/A	19,705	N/A
EAST TIMOR	6	N/A	6,040	N/A
ECUADOR	431	N/A	43,670	N/A
EGYPT	84	5,083	65,050	N/A
EL SALVADOR	65	N/A	10,886	N/A
EQUATORIAL GUINEA	7	N/A	2,880	N/A
ERITREA	13	N/A	4,010	N/A
ESTONIA	18	N/A	58,034	N/A
ETHIOPIA	58	681	36,469	N/A
FALKLAND ISLANDS (ISLAS MALVINAS)	7	N/A	440	N/A
FIJI	28	N/A	3,440	N/A
FINLAND	148	N/A	78,141	N/A
FRANCE	473	29,640	951,200	N/A
GABON	45	N/A	9,170	N/A
GAMBIA, THE	1	N/A	3,742	N/A
GEORGIA	22	N/A	20,329	N/A

Table F.3 Global Infrastructural Details (continued)

COUNTRY	AIRPORTS	RAILWAYS (KM)	ROADWAYS (KM)	WATERWAYS (KM)
GERMANY	541	41,981	644,480	N/A
GHANA	10	N/A	62,221	N/A
GREECE	82	N/A	116,711	N/A
GREENLAND	N/A	N/A	N/A	N/A
GRENADA	3	N/A	1,127	N/A
GUATEMALA	291	N/A	14,095	N/A
GUINEA	16	N/A	44,348	N/A
GUINEA-BISSAU	8	N/A	3,455	N/A
GUYANA	98	N/A	7,970	N/A
HAITI	14	N/A	4,160	N/A
HOLY SEE (VATICAN CITY)	N/A	N/A	N/A	N/A
HONDURAS	104	N/A	14,239	N/A
HONG KONG	2	N/A	2,067	N/A
HUNGARY	41	N/A	197,519	N/A
ICELAND	99	N/A	12,869	N/A
INDIA	352	63,974	3,320,410	14,500
INDONESIA	676	5,042	437,759	21,579
IRAN	324	8,442	172,927	N/A
IRAQ	104	2,272	44,900	N/A
IRELAND	39	N/A	96,036	N/A
ISRAEL	47	N/A	18,290	N/A
ITALY	130	20,255	487,700	N/A
JAMAICA	27	N/A	22,121	N/A
JAPAN	175	27,182	1,210,251	N/A
JORDAN	18	N/A	7,891	N/A
KAZAKHSTAN	97	N/A	93,612	N/A
KENYA	194	2,066	160,886	N/A
KIRIBATI	19	N/A	670	N/A
KOREA, NORTH	81	N/A	25,554	N/A
KOREA, SOUTH	114	3,381	103,029	N/A
KUWAIT	7	N/A	5,749	N/A
KYRGYZSTAN	28	N/A	34,000	N/A
LAOS	42	N/A	39,568	N/A
LATVIA	42	N/A	73,074	N/A
LEBANON	7	N/A	6,970	N/A
LESOTHO	24	N/A	7,091	N/A
LIBERIA	29	N/A	10,600	N/A
LIBYA	144	N/A	100,024	N/A
LIECHTENSTEIN	N/A	N/A	380	N/A
LITHUANIA	81	N/A	82,131	N/A
LUXEMBOURG	2	N/A	5,227	N/A
MACAU	1	N/A	413	N/A
MACEDONIA	14	N/A	13,736	N/A
MADAGASCAR	82	N/A	65,663	N/A
MALAWI	31	N/A	15,451	N/A
MALAYSIA	117	N/A	98,721	N/A
MALI	21	N/A	18,912	N/A
MALTA	1	N/A	3,096	N/A
MAURITANIA	28	N/A	11,066	N/A
MAURITIUS	5	N/A	2,066	N/A
MEXICO	1,724	17,166	366,095	N/A
MOLDOVA	10	N/A	9,343	N/A
MONACO	N/A	N/A	77	N/A
MONGOLIA	44	N/A	49,249	N/A
MONTENEGRO	5	N/A	7,624	N/A
MOROCCO	56	2,067	58,256	N/A
MOZAMBIQUE	100	N/A	30,331	N/A
NAMIBIA	112	N/A	64,189	N/A
NAURU	1	N/A	24	N/A
NEPAL	47	N/A	17,282	N/A
NETHERLANDS	27	N/A	136,827	N/A
NEW CALEDONIA	25	N/A	5,622	N/A
NEW ZEALAND	122	N/A	93,911	N/A
NICARAGUA	143	N/A	19,137	N/A
NIGER	30	N/A	18,949	N/A
NIGERIA	53	3,505	193,200	N/A

Table F.3 Global Infrastructural Details (continued)

COUNTRY	AIRPORTS	RAILWAYS (KM)	ROADWAYS (KM)	WATERWAYS (KM)
NORWAY	98	N/A	93,509	N/A
OMAN	130	N/A	53,430	N/A
PAKISTAN	151	7,791	260,760	N/A
PALAU	3	N/A	N/A	N/A
PANAMA	118	N/A	11,978	N/A
PAPUA NEW GUINEA	562	N/A	9,349	N/A
PARAGUAY	800	N/A	29,500	N/A
PERU	191	N/A	137,327	N/A
PHILIPPINES	247	995	213,151	N/A
POLAND	125	19,428	423,997	N/A
PORTUGAL	65	N/A	82,900	N/A
PUERTO RICO	29	N/A	26,670	N/A
QATAR	6	N/A	7,790	N/A
ROMANIA	53	N/A	82,386	N/A
RUSSIA	1,218	87,157	982,000	N/A
RWANDA	7	N/A	14,008	N/A
SAINT KITTS AND NEVIS	N/A	N/A	383	N/A
SAINT LUCIA	2	N/A	1,210	N/A
SAINT VINCENT AND THE GRENADINES	6	N/A	829	N/A
SAMOA	4	N/A	2,337	N/A
SAN MARINO	N/A	N/A	292	N/A
SAO TOME AND PRINCIPE	2	N/A	320	N/A
SAUDI ARABIA	216	N/A	221,372	N/A
SENEGAL	20	N/A	14,008	N/A
SERBIA	30	N/A	41,913	N/A
SEYCHELLES	14	N/A	508	N/A
SIERRA LEONE	8	N/A	11,300	N/A
SINGAPORE	9	N/A	3,356	N/A
SLOVAKIA	37	N/A	43,761	N/A
SLOVENIA	16	N/A	38,925	N/A
SOLOMON ISLANDS	36	N/A	1,360	N/A
SOMALIA	62	N/A	22,100	N/A
SOUTH AFRICA	567	20,192	362,099	N/A
SPAIN	152	15,293	681,298	N/A
SRI LANKA	18	N/A	91,907	N/A
SUDAN	72	5,978	11,900	N/A
SURINAME	47	N/A	4,304	N/A
SWAZILAND	15	N/A	3,594	N/A
SWEDEN	230	N/A	572,900	N/A
SWITZERLAND	64	N/A	71,454	N/A
SYRIA	99	N/A	68,157	N/A
TAIWAN	40	N/A	41,475	N/A
TAJIKISTAN	24	N/A	27,767	N/A
TANZANIA	106	3,689	91,049	N/A
THAILAND	103	4,071	180,053	N/A
TOGO	8	N/A	7,520	N/A
TONGA	6	N/A	680	N/A
TRINIDAD AND TOBAGO	5	N/A	8,320	N/A
TUNISIA	29	N/A	19,232	N/A
TURKEY	98	8,699	352,046	N/A
TURKMENISTAN	26	N/A	58,592	N/A
TUVALU	1	N/A	8	N/A
UGANDA	46	1,244	70,746	N/A
UKRAINE	412	21,684	169,496	N/A
UNITED ARAB EMIRATES	42	N/A	4,080	N/A
UNITED KINGDOM	462	16,454	394,428	N/A
UNITED STATES	15,079	224,792	6,506,204	41,009
URUGUAY	94	N/A	77,732	N/A
UZBEKISTAN	53	N/A	86,496	N/A
VANUATU	31	N/A	1,070	N/A
VENEZUELA	492	N/A	96,155	N/A
VIETNAM	44	2,632	180,549	N/A
WESTERN SAHARA	6	N/A	N/A	N/A
YEMEN	57	N/A	71,300	N/A
ZAMBIA	88	N/A	91,440	N/A
ZIMBABWE	202	N/A	97,267	N/A

Table F.4 Global Telecommunications Details

COUNTRY	TELEPHONES - MOBILE CELLULAR	TELEPHONES - MOBILE CELLULAR PER CAPITA	INTERNET HOSTS	INTERNET USERS
AFGHANISTAN	17,558,000	59	121	1,000,000
ALBANIA	3,100,000	104	15,505	N/A
ALGERIA	35,406,000	101	561	4,700,000
ANDORRA	65,000	77	28,131	N/A
ANGOLA	9,491,000	71	20,269	606,700
ANTIGUA AND BARBUDA	162,800	185	11,844	N/A
ARGENTINA	55,000,000	132	10,928,000	13,694,000
ARMENIA	3,211,000	108	192,541	N/A
AUSTRALIA	24,490,000	113	16,952,000	15,810,000
AUSTRIA	13,023,000	158	3,445,000	N/A
AZERBAIJAN	10,120,000	121	29,968	N/A
BAHAMAS, THE	298,800	95	20,674	N/A
BAHRAIN	1,694,000	139	46,035	N/A
BANGLADESH	85,000,000	54	69,285	617,300
BARBADOS	347,900	121	1,522	N/A
BELARUS	10,695,000	112	302,560	N/A
BELGIUM	12,541,000	120	5,180,000	N/A
BELIZE	203,000	63	7,464	N/A
BENIN	7,765,000	83	495	N/A
BHUTAN	484,200	68	14,714	N/A
BOLIVIA	8,353,000	83	167,769	N/A
BOSNIA AND HERZEGOVINA	3,171,000	69	146,152	N/A
BOTSWANA	2,900,000	140	2,674	N/A
BRAZIL	242,232,000	119	23,790,000	75,982,000
BRUNEI	443,200	110	49,403	N/A
BULGARIA	10,475,000	148	937,195	N/A
BURKINA FASO	7,682,000	46	1,833	178,100
BURMA	1,244,000	2	1,033	110,000
BURUNDI	1,980,000	19	236	N/A
CAMBODIA	10,000,000	68	13,768	78,500
CAMEROON	10,475,000	53	9,553	749,600
CANADA	25,858,000	76	8,515,000	26,960,000
CAPE VERDE	396,400	77	31	N/A
CAYMAN ISLANDS	95,100	185	23,079	N/A
CENTRAL AFRICAN REPUBLIC	1,124,000	23	20	N/A
CHAD	3,666,000	34	5	N/A
CHILE	22,400,000	133	1,854,000	7,009,000
CHINA	986,253,000	74	19,772,000	389,000,000
COLOMBIA	46,200,000	103	4,281,000	22,538,000
COMOROS	216,400	27	15	N/A
CONGO, DEMOCRATIC REPUBLIC OF THE	15,673,000	22	2,514	290,000
CONGO, REPUBLIC OF THE	3,885,000	92	43	N/A
COSTA RICA	4,358,000	95	146,164	N/A
COTE D'IVOIRE	17,416,000	81	8,598	967,300
CROATIA	5,115,000	114	725,521	N/A
CUBA	1,315,000	12	3,196	N/A
CZECH REPUBLIC	12,810,000	126	4,140,000	N/A
DENMARK	7,047,000	127	4,285,000	N/A
DJIBOUTI	193,000	25	209	N/A
DOMINICA	111,000	152	722	N/A
DOMINICAN REPUBLIC	8,771,000	88	404,057	N/A
EAST TIMOR	600,600	53	210	N/A
ECUADOR	15,333,000	102	162,281	3,352,000
EGYPT	70,661,000	85	200,336	20,136,000
EL SALVADOR	7,700,000	107	22,372	N/A
EQUATORIAL GUINEA	399,300	63	7	N/A
ERITREA	185,300	3	870	N/A
ESTONIA	1,653,000	127	848,009	N/A
ETHIOPIA	6,517,000	8	167	447,300
FALKLAND ISLANDS (ISLAS MALVINAS)	3,300	N/A	111	2,900
FIJI	1,000,000	106	22,754	N/A
FINLAND	8,390,000	160	4,700,000	N/A
FRANCE	64,000,000	100	16,840,000	44,625,000
GABON	1,610,000	106	103	N/A
GAMBIA, THE	1,478,000	83	491	N/A
GEORGIA	3,193,000	69	358,109	N/A

Table F.4 Global Telecommunications Details (continued)

COUNTRY	TELEPHONES - MOBILE CELLULAR	TELEPHONES - MOBILE CELLULAR PER CAPITA	INTERNET HOSTS	INTERNET USERS
GERMANY	105,000,000	128	20,416,000	65,125,000
GHANA	17,436,000	73	60,282	1,297,000
GREECE	12,293,000	114	3,115,000	N/A
GREENLAND	57,300	99	15,639	N/A
GRENADA	121,900	134	71	N/A
GUATEMALA	18,068,000	136	346,834	2,279,000
GUINEA	4,000,000	40	15	N/A
GUINEA-BISSAU	594,100	39	86	N/A
GUYANA	555,400	73	24,840	N/A
HAITI	4,000,000	44	541	N/A
HOLY SEE (VATICAN CITY)	N/A	N/A	102	N/A
HONDURAS	9,505,000	122	27,074	N/A
HONG KONG	13,416,000	190	861,516	N/A
HUNGARY	12,012,000	121	3,064,000	N/A
ICELAND	348,100	114	360,910	N/A
INDIA	752,000,000	64	6,738,000	61,338,000
INDONESIA	220,000,000	92	1,342,000	20,000,000
IRAN	67,500,000	102	167,453	8,214,000
IRAQ	24,000,000	83	23	325,900
IRELAND	4,702,000	112	1,380,000	N/A
ISRAEL	9,875,000	137	2,179,000	N/A
ITALY	82,000,000	141	25,456,000	29,235,000
JAMAICA	3,103,000	110	3,897	N/A
JAPAN	121,000,000	95	63,466,000	99,182,000
JORDAN	6,620,000	104	49,083	N/A
KAZAKHSTAN	19,768,000	128	65,988	5,299,000
KENYA	24,969,000	64	69,914	3,996,000
KIRIBATI	10,000	9	328	N/A
KOREA, NORTH	N/A	N/A	7	N/A
KOREA, SOUTH	50,767,000	105	293,862	39,400,000
KUWAIT	4,400,000	164	2,730	N/A
KYRGYZSTAN	5,275,000	97	116,586	N/A
LAOS	4,003,000	59	1,526	N/A
LATVIA	2,306,000	103	315,889	N/A
LEBANON	2,875,000	72	64,525	N/A
LESOTHO	698,800	33	1,581	N/A
LIBERIA	1,571,000	46	7	N/A
LIBYA	10,900,000	173	17,787	N/A
LIECHTENSTEIN	35,500	102	9,969	N/A
LITHUANIA	4,891,000	138	1,184,000	N/A
LUXEMBOURG	727,000	148	253,959	N/A
MACAU	1,122,000	198	284	N/A
MACEDONIA	2,153,000	104	62,718	N/A
MADAGASCAR	8,242,000	40	32,537	319,900
MALAWI	3,038,000	21	1,092	716,400
MALAYSIA	34,456,000	134	363,007	15,355,000
MALI	7,326,000	58	438	249,800
MALTA	455,400	112	14,687	N/A
MAURITANIA	2,745,000	88	28	N/A
MAURITIUS	1,191,000	93	51,123	N/A
MEXICO	91,363,000	82	15,165,000	31,020,000
MOLDOVA	3,165,000	73	696,685	N/A
MONACO	26,300	80	25,674	N/A
MONGOLIA	2,510,000	83	20,865	N/A
MONTENEGRO	1,170,000	174	9,915	N/A
MOROCCO	31,928,000	92	278,075	13,213,000
MOZAMBIQUE	7,224,000	33	82,804	613,600
NAMIBIA	1,535,000	73	77,948	N/A
NAURU	6,200	50	8,161	N/A
NEPAL	9,196,000	32	41,532	577,800
NETHERLANDS	19,310,000	116	13,715,000	14,872,000
NEW CALEDONIA	220,800	97	33,904	N/A
NEW ZEALAND	5,020,000	119	3,028,000	N/A
NICARAGUA	3,771,000	64	176,985	N/A
NIGER	3,806,000	25	229	115,900
NIGERIA	87,298,000	59	936	43,989,000

Table F.4 Global Telecommunications Details (continued)

COUNTRY	TELEPHONES - MOBILE CELLULAR	TELEPHONES - MOBILE CELLULAR PER CAPITA	INTERNET HOSTS	INTERNET USERS
NORWAY	5,525,000	119	3,584,000	N/A
OMAN	4,606,000	135	13,488	N/A
PAKISTAN	111,000,000	63	340,834	20,431,000
PALAU	14,500	70	4	N/A
PANAMA	6,496,000	193	10,984	N/A
PAPUA NEW GUINEA	1,909,000	32	4,847	N/A
PARAGUAY	5,915,000	85	278,473	N/A
PERU	29,115,000	99	232,515	9,158,000
PHILIPPINES	79,896,000	80	452,050	8,278,000
POLAND	46,000,000	120	12,928,000	22,452,000
PORTUGAL	15,195,000	142	3,664,000	N/A
PUERTO RICO	2,934,000	74	458	N/A
QATAR	2,329,000	280	887	N/A
ROMANIA	24,640,000	111	2,702,000	7,787,000
RUSSIA	238,000,000	170	13,758,000	40,853,000
RWANDA	3,549,000	34	1,277	450,000
SAINT KITTS AND NEVIS	84,600	211	52	N/A
SAINT LUCIA	179,300	112	90	N/A
SAINT VINCENT AND THE GRENADINES	131,800	126	336	N/A
SAMOA	167,400	76	18,074	N/A
SAN MARINO	24,000	79	11,097	N/A
SAO TOME AND PRINCIPE	102,500	48	1,646	N/A
SAUDI ARABIA	51,564,000	180	147,202	9,774,000
SENEGAL	8,344,000	61	217	1,818,000
SERBIA	9,915,000	134	1,102,000	N/A
SEYCHELLES	117,600	134	238	N/A
SIERRA LEONE	2,000,000	31	280	N/A
SINGAPORE	7,307,000	157	1,932,000	N/A
SLOVAKIA	5,925,000	108	1,387,000	N/A
SLOVENIA	2,122,000	106	417,984	N/A
SOLOMON ISLANDS	30,000	5	4,354	N/A
SOMALIA	648,200	7	113	N/A
SOUTH AFRICA	50,372,000	103	4,835,000	4,420,000
SPAIN	51,493,000	127	4,232,000	28,119,000
SRI LANKA	17,359,000	81	8,652	1,777,000
SUDAN	17,654,000	43	90	4,200,000
SURINAME	890,000	185	186	N/A
SWAZILAND	732,700	65	2,706	N/A
SWEDEN	10,650,000	118	5,727,000	N/A
SWITZERLAND	9,527,000	125	5,249,000	N/A
SYRIA	11,696,000	58	420	4,469,000
TAIWAN	27,840,000	121	6,166,000	16,147,000
TAJIKISTAN	5,941,000	81	4,268	N/A
TANZANIA	20,984,000	50	25,832	678,000
THAILAND	69,683,000	106	3,278,000	17,483,000
TOGO	2,452,000	41	1,165	N/A
TONGA	54,300	45	20,766	N/A
TRINIDAD AND TOBAGO	1,894,000	154	241,640	N/A
TUNISIA	11,114,000	106	575	N/A
TURKEY	61,770,000	80	3,625,000	27,233,000
TURKMENISTAN	3,198,000	65	717	N/A
TUVALU	2,500	20	138,579	N/A
UGANDA	12,828,000	40	33,082	3,200,000
UKRAINE	53,929,000	118	1,997,000	7,770,000
UNITED ARAB EMIRATES	10,926,000	228	371,969	N/A
UNITED KINGDOM	80,799,000	132	8,409,000	51,444,000
UNITED STATES	279,000,000	91	498,000,000	245,000,000
URUGUAY	4,437,000	127	945,826	N/A
UZBEKISTAN	20,952,000	76	56,334	4,689,000
VANUATU	285,300	131	5,656	N/A
VENEZUELA	27,880,000	104	888,028	8,918,000
VIETNAM	154,000,000	177	175,612	23,382,000
WESTERN SAHARA	N/A	N/A	N/A	N/A
YEMEN	11,085,000	47	33,279	2,349,000
ZAMBIA	4,947,000	42	16,372	816,200
ZIMBABWE	7,500,000	66	30,650	1,423,000

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INTERVIEWS

Carl Adkins, General Manager (Georgia Dome) – December 19, 2013

Harry Hiller, PhD, Professor of Sociology (University of Calgary) – September 25, 2013

Melissa Heiter (ICON Venue Group) – November 12, 2013

Norman Friedman, AIA, LEED AP (Populous) – November 7, 2013 and January 28, 2014

Ryan Whitacre, AIA, LEED AP BD+C (Gensler) – September 30, 2013 and January 31, 2014

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PHOTO AND IMAGES

Figure 2.1 (a) - http://www.faculty.umb.edu/gary_zabel/Courses/Phil%20281/Philosophy%20of%20Magic/My%20Documents/Paleolithic%20Art.htm

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Figure 2.15 (a) - http://3.bp.blogspot.com/-nCSbfIv1n2c/UEpWvqv5igI/AAAAAAAAAN8/ewk_76py-OQ/s1600/057+olympic+stadium.jpg

Figure 2.15 (b) - <http://static.panoramio.com/photos/large/62872475.jpg>

Figure 2.16 (a) - http://upload.wikimedia.org/wikipedia/commons/3/35/2008_Summer_Olympics_flame_at_Beijing_National_Stadium_1.jpg

Figure 2.16 (b) - http://media.npr.org/assets/img/2012/07/09/chinaolympics_2-d596cd089e8f292564420e38efffb5a051727de3-s6-c30.jpg

Figure 2.17 (a) - http://media.sacbee.com/static/weblogs/photos/images/2010/jun10/world_cup_sm/world_cup03.jpg

Figure 2.17 (b) - <http://puzzles-games.eu/data/media/7/World-Cup-2010-South-Africa-Fans-with-Zakumi.jpg>

Figure 2.18 (a) - <http://gofatherhood.com/wp-content/uploads/2012/07/nbc-london-2012-olympics-opening-ceremony-2.png>

Figure 2.18 (b) - <http://static.guim.co.uk/sys-images/Guardian/Pix/pictures/2013/11/20/1384968440039/Olympic-Stadium-011.jpg>

Figure 2.19 (a) - http://www.thetimes.co.uk/tto/multimedia/archive/00380/121208683_Sochi_380592b.jpg

Figure 2.19 (b) - http://cdn.theatlantic.com/static/infocus/sochi020714/s_s01_67578719.jpg

Figure 3.1 - maps re-generated from <http://www.indexmundi.com/map/>

Figure 3.2 - maps re-generated from <http://www.indexmundi.com/map/>

Figure 3.3 - maps re-generated from <http://www.indexmundi.com/map/>

Figure 3.4 - maps re-generated from <http://www.indexmundi.com/map/>

Figure 3.5 - maps re-generated from <http://www.indexmundi.com/map/>

Figure 3.6 - maps re-generated from <http://www.indexmundi.com/map/>

Figure 3.7 - maps re-generated from <http://www.indexmundi.com/map/>

Figure 3.8 - maps re-generated from <http://www.indexmundi.com/map/>

Figure 4.1 (a) - self-generated

Figure 4.1 (b) - self-generated

Figure 4.2 (a) - self-generated

Figure 4.2 (b) - self-generated

Figure 5.1 (a) - self-generated

Figure 5.1 (b) - self-generated

Figure 5.1 (c) - self-generated

Figure 5.1 (d) - self-generated

Figure 5.1 (e) - self-generated

Figure A.1 - self-generated

Figure A.2 - http://www.sportslogos.net/teams/list_by_league/27/Summer_Olympics/N/logos/

Figure A.3 - self-generated

Figure A.4 - self-generated

Figure A.5 - self-generated

Figure B.1 - self-generated

Figure B.2 - http://www.sportslogos.net/teams/list_by_league/27/Summer_Olympics/N/logos/

Figure B.3 - self-generated

Figure B.4 - self-generated

Figure B.5 - self-generated

Figure C.1 - self-generated

Figure C.2 - <http://football2014wc.com/fifa-world-cup-2014-logo-and-poster/82/>

Figure C.3 - self-generated

Figure C.4 - self-generated

Figure C.5 - self-generated

Figure F.1 - maps re-generated from <http://www.indexmundi.com/map/>

Figure F.2 - maps re-generated from <http://www.indexmundi.com/map/>

Figure F.3 - maps re-generated from <http://www.indexmundi.com/map/>

Figure F.4 - maps re-generated from <http://www.indexmundi.com/map/>

Figure F.5 - maps re-generated from <http://www.indexmundi.com/map/>

Figure F.6 - maps re-generated from <http://www.indexmundi.com/map/>

Figure F.7 - maps re-generated from <http://www.indexmundi.com/map/>

Figure F.8 - maps re-generated from <http://www.indexmundi.com/map/>

Figure F.9 - maps re-generated from <http://www.indexmundi.com/map/>

Figure F.10 - maps re-generated from <http://www.indexmundi.com/map/>

Figure F.11 - maps re-generated from <http://www.indexmundi.com/map/>

Figure F.12 - maps re-generated from <http://www.indexmundi.com/map/>

Figure F.13 - maps re-generated from <http://www.indexmundi.com/map/>

Figure F.14 - maps re-generated from <http://www.indexmundi.com/map/>

Figure F.15 - maps re-generated from <http://www.indexmundi.com/map/>